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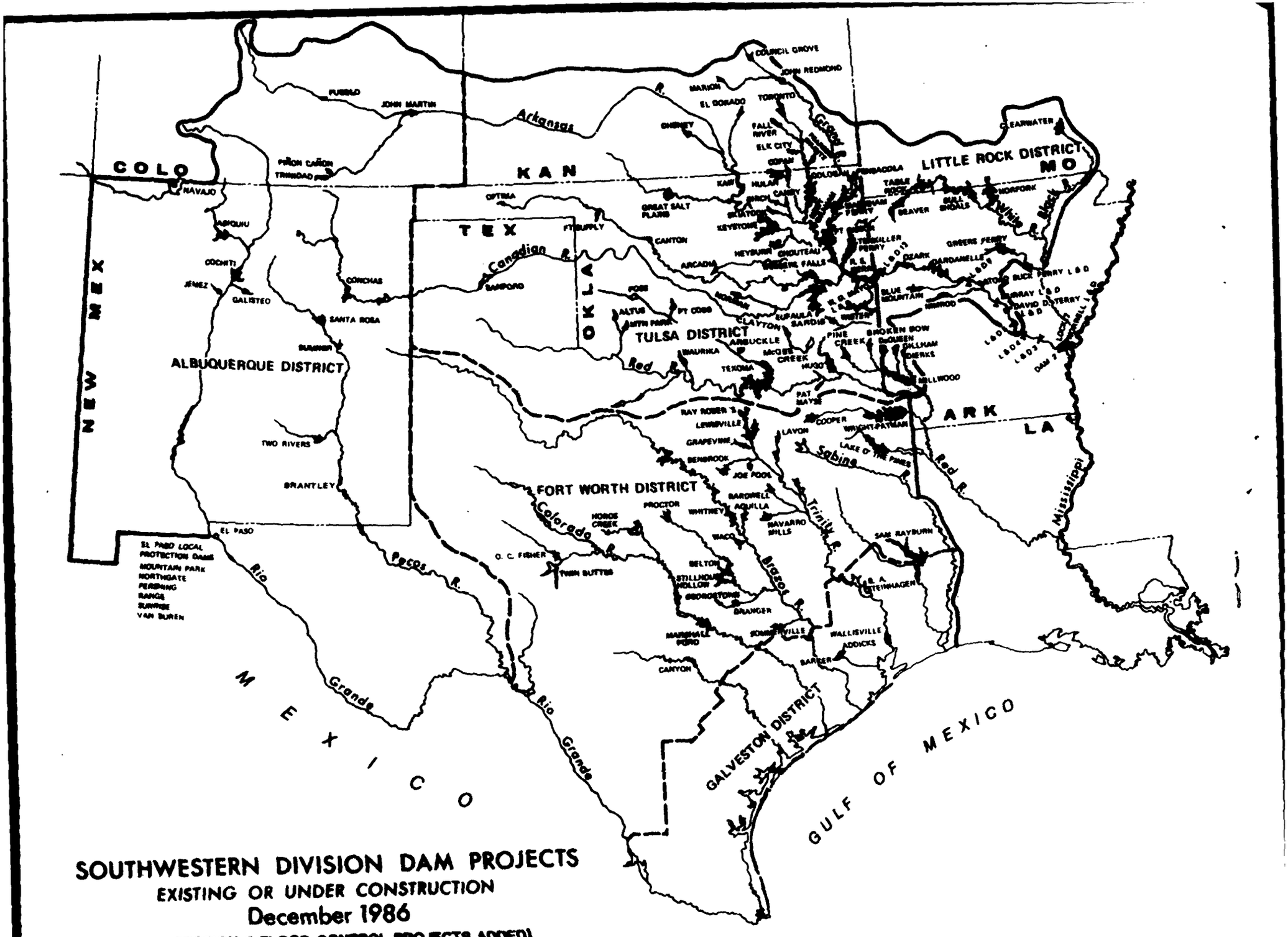
US Army Corps
of Engineers
Southwestern Division
Reservoir Control Center

Annual Report 1987

January 1988

THE PACESETTER DIVISION



SOUTHWESTERN DIVISION DAM PROJECTS

EXISTING OR UNDER CONSTRUCTION

December 1986

(WITH SECTION 7 FLOOD CONTROL PROJECTS ADDED)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report presents activities and accomplishments of the Southwestern Division (SWD) as related to reservoir regulation and water management activities for fiscal year 1987. Also presents detailed summaries of reservoir conditions, water quality activities, and coordinating activities with other Federal and non-Federal basin interests groups. Requires:

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1987

ANNUAL REPORT

RESERVOIR CONTROL CENTER

SOUTHWESTERN DIVISION

PLATE

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RESERVOIR CONTROL CENTER

1987 ANNUAL REPORT

SECTION I - INTRODUCTION

SECTION I - INTRODUCTION

1. PURPOSE OF REPORT. This report presents activities and accomplishments of the Southwestern Division (SWD) as related to reservoir regulation and water management activities throughout FY 1987. Detailed summaries of reservoir conditions, water quality activities, minutes of coordinating committee meetings and minutes of the 1987 Annual Reservoir Control Center meeting are also included.

This report is prepared in conformance with ER 1110-2-1400, 24 April 1970, Reservoir Control Centers, paragraph 12c.

2. REFERENCE. Reservoir Control Center (RCC) - SWD Guidance Memorandum, dated June 1971, approved by the Chief of Engineers as a general basis for the RCC's activities.

3. OBJECTIVES OF THE RESERVOIR CONTROL CENTER. The SWD RCC was established in 1967 by the Chief of Engineers to improve capabilities of the Corps of Engineers to perform its civil works mission as related to operation of reservoirs. The SWD RCC carries out its responsibilities by:

a. Organizing coordinating committees and/or participating in committees to accomplish mutual understanding among water interests regarding use and regulation of water resources.

b. Providing interbasin coordination of day-to-day regulation needs for river systems for all purposes.

c. Surveillance of daily operations and continuous analysis of Project needs.

d. Furnishing technical assistance to personnel of District offices in related efforts to improve the reliability of regulations and hydrologic determinations.

SECTION II - WATER CONTROL ACTIVITIES IN SWD

SECTION II - WATER CONTROL ACTIVITIES IN SWD

1. RESERVOIR REGULATION

a. Lake Regulation During FY 87. Lake regulation activities for Division lakes and Section 7 lakes during FY 87 are summarized in Section VI of this report. Operational data summaries for all of the SWD projects, including Section 7, are shown in tabular form, Section VII. An index, by basin, to these tables is included which also lists pertinent data for each project. Also included is a listing in alphabetical order giving names of both the lake and dam where different.

b. System Regulation Plans. Several System regulation plans for the White River Basin were developed in 1987. Documentation of the the White River model runs will be completed in early 1988. The Hydrology for the Arkansas River Basin model has been updated through December 1986. Studies are planned for the Arkansas River Basin in FY 88. Hydrology for the Brazos River Basin has been verified. Reservoir regulation simulation and yield studies are planned for the Brazos River Basin in FY 88.

c. Water Control Manuals. A summary entitled "Status of Water Control Manuals in SWD" is included in Section IV of this report. The summary shows the status and completion schedule through FY 1990 for manuals and plans on 119 lakes and 16 river systems and subsystems. At the end of FY 1987, there were 93 Corps of Engineers projects (76 lakes and 17 locks and dams) and 18 Section 7 lakes in operation in SWD.

During FY 1987, the SWD Reservoir Control Center received and reviewed four water control manuals that were submitted by the Districts. The schedule for FY 1988 includes the development of five new manuals and the revision of nine old manuals.

d. Section 7 Project Regulation. Within SWD there are 18 existing Section 7 reservoirs owned and operated by other agencies. Presently, the Bureau of Reclamation has one additional Reservoir under construction, Brantley Dam to be located on Pecos River. McGee Creek Dam located on Muddy Boggy Creek, a tributary of the Red River, began deliberate impoundment on 2 April 1987. The flood control storage contained in these projects are regulated by the Corps in accordance with Section 7 of the Flood Control Act of 1944. The Districts are continuing their efforts to bring the manuals and regulation plans into compliance with requirements contained in paragraph 208.11, Part 208 Flood Control Regulations, Chapter 11, Title 33 of the Code of Federal Regulations (41 FR 20401, May 18. 1976). Due to the varied approaches between the Districts on real time regulation for Section 7 projects, SWDO issued a policy letter on 21 March 1983.

The purpose of the letter was to supersede previous SWDO guidance and to provide current policies on Section 7 projects. This letter and subsequent letters have been issued to the Districts requesting that policy on Section 7 projects be coordinated with project owners and that finalizing of water control manuals for existing projects should be expedited.

2. SOUTHWESTERN DIVISION WATER QUALITY PROGRAM AND ACTIVITIES.

a. Responsibilities. The Water Management Branch is assigned the responsibilities to coordinate and direct activities in SWD in the water quality field. This provides for water quality objectives being included as an effective part of our total water management program. Specific activities in the water quality program are as follows:

(1) Conduct technical studies and provide guidance on water ouality control.

(2) Review and provide technical assistance in programs for predicting the natural and modified water quality in impoundments, rivers, coastal areas, and estuaries for project planning, design, and regulation activities.

(3) Review and provide technical assistance on project design and reservoir regulation studies in connection with water quality control performed within the Division, including multiple level outlet facilities, reservoir simulation studies, reregulation structures, and release reoxygenation systems.

(4) Provide coordination support in interagency liaison as related to water quality control through reservoir regulation, including formulation of operating plans and cooperative data collection programs.

(5) Coordinate with Planning and Construction-Operations Divisions, and the Districts on SWD water quality investigation programs.

(6) In coordination with the Geotechnical and Materials Branch, manage the water quality investigation activities of the Division laboratory.

(7) Responsible for technical engineering solutions to water quality problems in existing projects: reviewing, coordinating, and acting as consultants to other engineering and planning elements in the Division office and District offices.

(8) Coordination of Division actions required by ER 1130-2-334 for reporting of water quality management of Corps projects.

b. ORGANIZATION.

(1) Division. Water quality activities in SWD are coordinated within the Water Management Branch. These duties require the part-time efforts of two engineers in Water Management Branch, one engineer in Construction-Operations and a fisheries biologist, and an ecologist in Planning Division. Mr. Charles Sullivan, Chief, ECC, is the SWD member on the HQUSACE Committee on Water Quality.

(2) Districts. The organizations for water quality management vary within the Districts. In all of the Districts, water quality associated with planning and design of the projects is coordinated by organizational elements within the Engineering or Planning Divisions. In two of the Districts the monitoring and reporting specifically required by ER 1130-2-334 and that required for dredging and other construction are done by the Construction and Operations Divisions.

(3) Laboratory. The Division laboratory is staffed and equipped to conduct water quality testing required by the Districts for use in planning, design, construction, and operation of the projects. However, because of location costs and other factors most water quality testing is contracted out by the Districts.

c. Special Activities in FY 87.

(1) Specific Project Problems. Water Quality related problems and activities at individual projects are discussed in the District reports.

(2) Water Quality Management Reports. Water quality management reports were completed for two additional projects in FY 87. Water quality management reports are now available on 17 SWD projects. Most of these reports are for Fort Worth District projects.

(3) Base Line Data. Base line data acquisition was initiated at two additional SWD reservoir projects in FY 87. As of the end of the year base line data has been obtained at over 40 reservoirs. Our goal in this program is to develop a water quality data base for all SWD reservoir projects.

(4) Table Rock Dissolved Oxygen. A group selected by the HQUSACE Water Quality Committee reviewed the Table Rock dissolved oxygen situation in December 1986 and made several recommendations for possible solutions. LRD is persuing a course of action to determine if selective withdrawal facilities on two units is a viable solution to the problem. WES is currently conducting mathmatical and physical model studies for them. Preliminary results indicate selective withdrawal may not be a viable solution. Testing will continue in FY 88.

d. Long-Term Goals. The following are presently considered as long-term continuous goals of this Division, and consequently the Water Management Branch, in the water quality field.

(1) To obtain sufficient water quality information from all of our projects to determine whether all state standards and environmental objectives can be met without adverse impact on authorized uses.

(2) To promote the organization of effective water quality elements in the Division and Districts to obtain the maximum coordination for handling all water quality matters in the Division.

(3) To provide helpful and thorough guidance to the Districts on water quality matters.

e. Immediate Goals. The following actions have been scheduled for accomplishment in the near future:

(1) Continue the present intensive monitoring program for SWD reservoirs. This ongoing program will be continued until base line data are available for all SWD reservoirs.

(2) Review the basic water quality monitoring program this year.

3. SWD SEDIMENT PROGRAM AND ACTIVITIES. Sediment activities for the year included field surveys for one reservoir resurvey and the resurvey of 118 sediment ranges along the McClellan-Kerr Arkansas River Navigation Project. Due to the funding priorities assigned to reservoir sedimentation resurveys, it's almost impossible to receive funding. Several water contracting entities have expressed an interest in obtaining resurveys to determine the depletion rates on their resource but we have been unable to obtain the necessary funding.

4. DATA COLLECTION AND MANAGEMENT.

a. Stream Gaging Program. The reporting and measurement of flow, water quality and sediment data are required for regulation, investigation and design of water resources projects. Most of these data are obtained through a Cooperative Steam Gaging program between the Corps and USGS. During FY 1987 the SWD-USGS cooperative program contained 432 surface water stations,. 48 water quality stations, and 56 suspeneded sediment stations. An additional 73 stations were operated independently bv the District Corps offices. In FY 87, the total cost of the SWD program was $2.8 million with $2.3 million being transferred to the USGS. The following tabulation shows a breakdown of the program by class of funds used to finance the program.

Class of Funds	C of E Cost ($1,000)
Survey Investigation	22
General Coverage	55
Planning	0
Operation & Maintenance	2,094
New Work & Construction	86
TOTAL:	2,257

b. Cooperative Reporting Networks. The National Weather Service (NWS) and the Corps of Engineers began their 50th year of cooperation in establishing and operating networks of river and/or rainfall reporting stations. Reports from these stations supplement those stations that are maintained by the NWS which are made available to the Corps of Engineers for flood control operations and flood forecasting. Data from these networks are transmitted to the Corps of Engineers District and Division offices via telephone and computer interface from the NWS collection office. A direct interface between the NWS S/140 computers located in the Fort Worth, Texas and Tulsa, Oklahoma NWS River Forecast Centers and WCDS Harris carries hydrological reports, and other data essential to our water control management functions. These data include detailed precipatation reports, river stage information, warnings, and descriptions of severe storms and floods, and river forecasts developed by the NWS. SWDO has obtained a Color Radar Machine which can dial NWS radar sites and get current radar images which can be retained for later viewing.

The estimated FY 1987 cost for SWD responsibilities in supporting 486 rainfall stations in the Cooperative Reporting Networks was $288,706.

c. Water Control Data System. The "Water Control Data System Master Plan" for SWD, dated April 1979 was approved by the Office, Chief of Engineers in June 1979 for funding and detailed design. A "Water Control Data System Software Manual," dated February 1983 was developed as the system software design document.

(2) Communication. The DCP's transmit the remote gaging station data over the Geostationary Orbiting Environmental Satellite (GOES) System. Communication between the District and Division data processing units is via the Division wide data communications network. A ground Receive Station (GRS) is located at Fort Worth, Texas, for receipt of the GOES transmission. The SWD system was installed at the Federal Center in Fort Worth, Texas, in September 1983. This is a Synergetics Model 10C direct Readout Ground Receive Station equipped with 2 antennas (one for GOES east and one for GOES west). Both dial-up and direct line access is provided between the GRS and the WCDS computers. Data transfer between the Corps and National Weather Service River Forecast Center computers is via direct lines which tie into the communication network.

(3) Data Acquisition and Analysis. In June 1982, the RCC began using the Water Control Data System (Harris Computer) located in the Southwestern Division office, for computations that are necessary in the RCC's daily water control activities. Harris minicomputers were installed in the SWDO, Tulsa District, Fort Worth District, and Little Rock District offices as a part of the Water Control Data System. The Albuquerque and Galveston Districts operate remotely from the SWDO computer. During FY 85 (as part of the Corps wide procurement contract) the old H-100 and H-5-00 computers were replaced by Harris 1000 computers. The hardware at each site is compatible in order to allow the use of common software and data exchange between offices. The data bases at each District office are available to the Division office. The data base uses the "TOTAL" data base management system and the SHEF code for data exchange with the National Weather Service. During FY 87 work has continued on software development for analysis and display of the data.

(4) Data Display and Distribution. Data is displayed in individual offices with monochrome and color graphic CRT's, PC's, plotters, and printers. Graphic applications programs utilize "TEMPLATE" Software which is licensed by Megatek Corporation. Provisions are made to exchange data with other water management cooperators. Examples of cooperative data exchange requirements are the Office of Chief Engineers, Lower Mississippi Valley Division (LMVD), National Weather Service, Southwestern Power Administration (SWPA), state and local river authorities or agencies. During the past year several routines were developed for the display of information in a graphical format. There also have been several "User Friendly" routines developed for display of project data and reports.

d. Cooperative Data Base and Forecasting Activity. The RCC continues to participate in and encourage the advancement of programs for automated data collection and interagency cooperation in forecasting activity and data base utilization. Currently, SWD maintains a data base on the WCDS for Daily Generation reports,

and daily River Reports. These data bases are updated daily and the data are maintained until the end of the month then used for monthly summaries. These data, with several District auxiliary programs and data bases, have been used to make forecasts and reports available for exchange as needed between the Districts and SWDO. In addition, the data are made available to other users which have a need to be aware of the water control activities on a real-time basis. These users participated in storing data in the USGS WATSTORE data bank. This system has also been used for retrieving data. The Little Rock District has placed sediment data in the WATSTORE data system.

5. COORDINATION WITH WATER MANAGEMENT INTERESTS.

a. General. The benefits deriving from personal contact with other persons associated with water management activities are well recognized by the RCC. For this reason, special emphasis has been placed on maintaining this personal contact through meetings and workshops sponsored by the Districts and the RCC with the marketing agency, project personnel, river basin authorities, other RCC's, the Chief's office and others.

(1) The Hydrologic Engineering Section and the Hydraulics Section (other sections in the Water Management Branch) furnish support to the RCC. The Hydrologic Engineering Section conducts systems studies of Reservoir Regulation and the Hydraulics Section reviews studies on sediment and water quality activities.

(2) A meeting of lake regulation personnel of each of the Districts and the RCC is held annually at the Division Reservoir Control Center for the purpose of discussing timely topics and exchanging information. Periodically the Hydrologic Engineering and the Hydraulics Sections will hold joint meetings with the RCC. The minutes of the 3 and 4 November 1987 meeting are included in Section VIII.

b. Agency Coordination.

(1) Arkansas River Basin Coordinating Committee. After being inactive since the 30 April 1982 meeting in Little Rock, Arkansas the committee was reestablished in connection with the notification of adoption of the "1986 Arkansas River Water Control System Operation Plan." The notification for the plan was issued on 17 June 1986 with the plan becoming effective on 1 July 1986. A meeting of the committee was held in Dallas on 28 January 1987. The minutes of the meeting are included in section VIII.

(2) Cooperation with Lower Mississippi Valley Division. The SWD RCC continues its cooperation with LMVD and provides observed, as well as forecasted data, that are significant to the water management activities in LMVD.

(3) Cooperation with Southwestern Power Administration. The SWPA is an agency of the United States, established in the Department of Energy, to execute the purposes of the Flood Control Act of 1944 with respect to the disposition of the electric power and energy made available from the reservoir projects under control of the Department of the Army in the area comprising all of Arkansas and Louisiana and portions of Missouri, Kansas, Texas, and Oklahoma. The scheduling of releases for hydroelectric power production from the 17 Corps of Engineers projects within SWD has a significant effect on the overall water management activities in the Division. Therefore, close cooperation and continuous communication between the Corps and SWPA are mandatory. A Memorandum of Understanding was signed by the SWPA and the Corps of Engineers in 1980. SWPA and SWD have proceeded to develop a draft detail Operating Arrangement to assist in the operations of hydropower projects within SWD. SWD has formally informed the SWPA that the draft document would be its policy for coordinating operations with them until such time that both agencies have signed the arrangement. Specific activities included in the Operating Arrangement for cooperation between SWPA and RCC are monthly scheduling of power production, preparation of data for reports to the Federal Energy Regulatory Commission (FERC), and daily coordination of routine data on current conditions, inflow forecasts, and release schedules. The RCC has taken every opportunity to improve and strengthen relations with SWPA through correspondence, regularly scheduled and special meetings, providing access to our time-share systems, and by special studies aimed at improving energy production and scheduling at SWD power projects.

(4) National Weather Service. Future workshops will be scheduled for establishing criteria and implementation procedures for comprehensive interagency data bases. During the past year, meetings between the Corps and NWS were held to refine procedures for computer to computer exchange of hydrometeorological data. Meetings were also held to improve coordinated snow runoff forecasts. AFOS products are being furnished from the NWS S/140 computers to the CE H-1000 computers on a continuous basis via direct line between these machines. NWS has been developing software which will allow the transmission of the AFOS Graphics products to the Corps and these are being received through the VUEWS Program.

(5) General Accounting Office (GAO). The SWD RCC has continued to cooperate with GAO in their investigation of the forecasting and regulation activities which were associated with the October 1986 flood in Oklahoma. This review was initiated during the latter stages of the flood event and has continued through the current FY. We have furnished GAO documentation on project plans of regulations, weather data, stream flow data, lake data, etc., which was available during the flood. The assembly of this information has involved numerous man-hours of effort during 1987. GAO has completed an interim report (1987) and a final report is expected in 1988.

SECTION III FACILITIES AND PERSONNEL

SECTION III - FACILITIES AND PERSONNEL

1. Facilities.

a. Office Space. SWDO personnel occupies quarters in the Sante Fe Building, 1114 Commerce Street, Dallas. Texas. Space occupied by the RCC includes an open-space working area, and an equipment room.

b. Display Facilities. All of the display equipment used for conferences and for briefings of higher authorities are located in the Engineering Division conference room. This room has limited space and equipment; but, it does include chalkboards, white metal panel adequate for use of markers, portable projection equipment, a projection screen, and a large screen display unit driven by an IBM-XT.

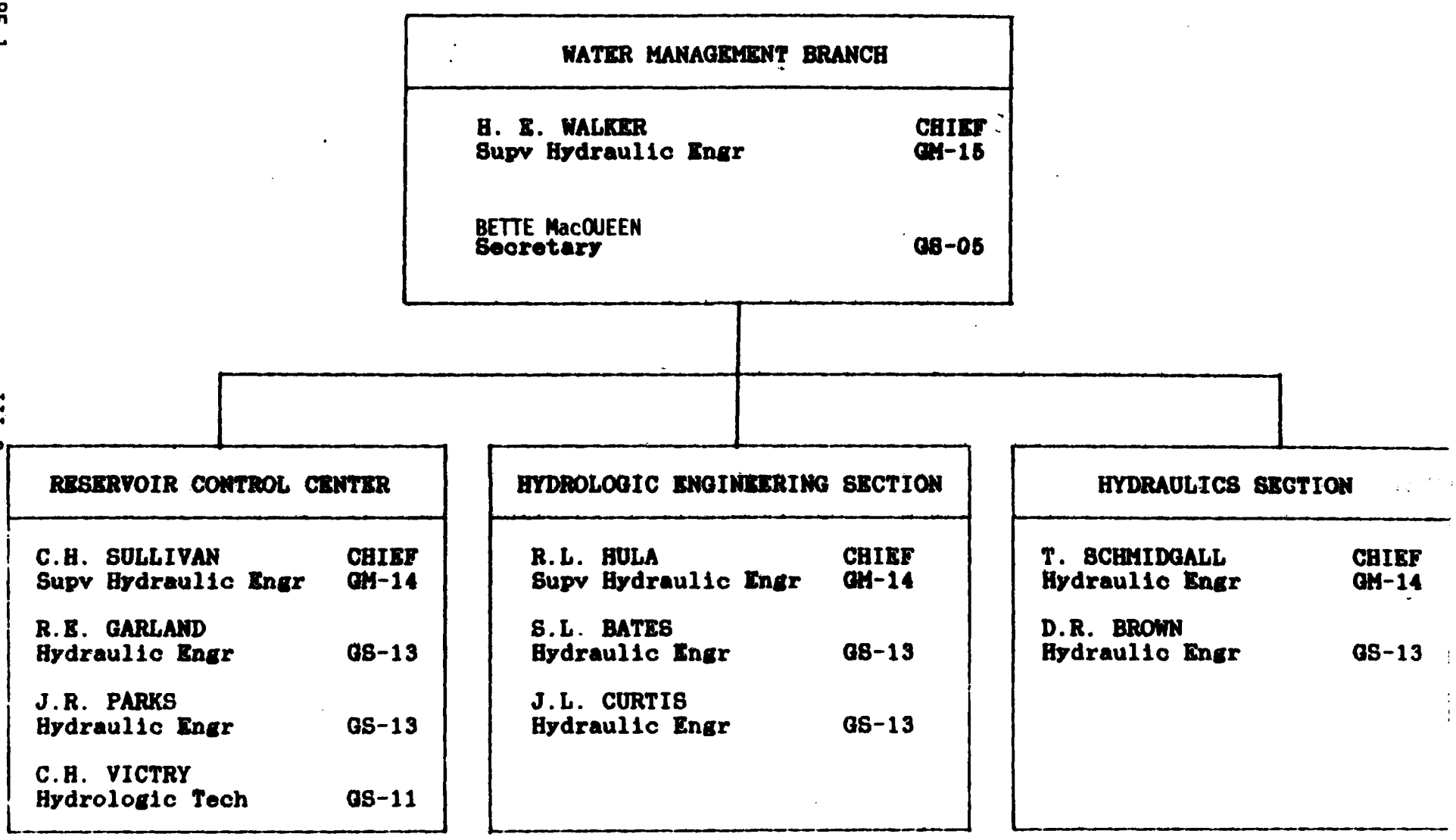
c. Communications Equipment. The equipment room contains a multiplexor, two dot-matrix hard-copy TTY terminals, one letter quality terminal, a tektronix color graphics terminal with plotter, printer and digitizing tablet, IBM-AT and printer, IBM-XT which is used to drive the large screen display, Sony color monitor with VTR and an Alden Color Radar system. The Sony color monitor is used to monitor and record weather and news events on the Cable News Network, Weather Channel, and local TV stations. The Alden Color Radar system is used to monitor and record radar images from National Weather Service radars within SWD and along the Gulf Coast. The TTY terminals are used for access of the Harris, WRDC, and other computer facilities. The room also contains a back-up tape storage area. The SWD Ground Receive Station (for receipt of remote sensor information via GOES) is located at the Federal Center in Fort Worth, Texas.

2. Personnel.

a. Staff. The authorized staff of the RCC consists of one supervisory hydraulic engineer, two hydraulic engineers and one hydrologic technican. The RCC is supported in technical studies by the Hydrologic Engineering and the Hydraulics Sections. The current organization chart for the SWD Water Management Branch is shown in figure 1.

b. Training. The RCC periodically assesses the training needs of its personnel and schedules that training which is required and possible. Training for the past year included courses on the use of Lotus 1-2-3 and Wordstar.

FIGURE 1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SECTION IV - STATUS OF RESERVOIR WATER CONTROL MANUALS IN SWD

STATUS OF WATER CONTROL MANUALS IN SWD
(Report Control Symbol DAEN-CWE-16) Revised: JANUARY 1988

RESERVOIR	STREAM	OWNER	DIST	WATER CONTROL MANUAL SUBMITTED	SCHEDULED THRU FY 90	APPROVED	
WHITE RIV MASTER		CE	LRD	DEC 54 F	SEP 90 U	DEC 55 OCE	
BEAVER	WHITE RIV BASIN	CE	LRD	OCT 66 F		JAN 67 OCE	
TABLE ROCK	WHITE RIV BASIN	CE	LRD	OCT 66 F		JAN 67 OCE	
BULL SHOALS	WHITE RIVER BASIN	CE	LRD	OCT 66 F		JAN 67 OCE	
NORFORK	WHITE RIVER BASIN	CE	LRD	OCT 66 F		JAN 67 OCE	
CLEARWATER	BLACK RIVER	CE	LRD	JAN 73 U		FEB 73 SWD	R*
GREERS FERRY	LITTLE RED RIVER	CE	LRD	OCT 65 F		JUN 66 OCE	
ARKANSAS MASTER		CE	AD	APR 69 F		JUN 70 OCE	
PUEBLO (1)	ARKANSAS RIVER	BR	AD	DEC 77 F		JUN 84 SWD	
TRINIDAD	PURGATORIE RIVER	CE	AD	FEB 85 U		SEP 85 SWD	
JOHN MARTIN	ARKANSAS RIVER	CE	AD	NOV 82 U		JAN 83 SWD	AR
ARKANSAS MASTER		CE	TD	APR 76 U		SEP 80 SWD	
CHENEY (1)	N.F.NINNESCAH	BR	TD	OCT 65		MAR 66 OCE	AR
EL DORADO	WALNUT RIVER	CE	TD	FEB 81 F		FEB 83 SWD	
KAW	ARKANSAS RIVER	CE	TD	DEC 77 F		JAN 78 SWD	
GREAT SALT PLAINS	SALT FORK ARK	CE	TD	NOV 66 F		APR 67 OCE	
KEYSTONE	ARKANSAS RIVER	CE	TD	NOV 63 F		APR 65 OCE	
HEYBURN	POLECAT CREEK	CE	TD	JUL 84 U		DEC 84 SWD	
VERDIGRIS SYSTEM							
TORONTO	VERDIGRIS RIVER	CE	TD	JUN 66 F	FEB 88 U	AUG 66 OCE	
FALL RIVER	FALL RIVER	CE	TD	JUN 66 F		AUG 66 OCE	
ELK CITY	ELK RIVER	CE	TD	JUN 66 F		AUG 66 OCE	
PEARSON-SKUBITZ-BIG HILL	BIG HILL CREEK	CE	TD	AUG 82		SEP 82 SWD	AR
OOLOGAH	VERDIGRIS RIVER	CE	TD	DEC 75 U		JAN 76 SWD	AR
COPAN	CANEY RIVER	CE	TD	NOV 82 F		MAR 83 SWD	
HULAH	CANEY RIVER	CE	TD	OCT 68		JUN 69 OCE	AR
BIRCH	BIRD CREEK	CE	TD	AUG 81 F		SEP 81 SWD	
SKIATOOK	HOMINY CREEK	CE	TD	APR 84 F		DEC 84 SWD	

STATUS OF WATER CONTROL MANUALS IN SWD
(Report Control Symbol DAEN-CWE-16) Revised: JANUARY 1988

RESERVOIR	STREAM	OWNER	DIST	WATER CONTROL MANUAL SUBMITTED	SCHEDULED THRU FY 90	APPROVED	
UPPER GRAND SYS							
COUNCIL GROVE	NEOSHO RIVER	CE	TD	APR 74 F		MAY 74 SWD	
MARION	COTTONWOOD RIVER	CE	TD	JUL 74 F		AUG 74 SWD	
JOHN REDMOND	NEOSHO RIVER	CE	TD	SEP 76 R			
PENSACOLA (1)	NEOSHO RIVER	GRDA	TD	SEP 64		MAR 65 OCE	AR
MARKHAM FERRY (1)	NEOSHO RIVER	GRDA	TD	SEP 64		MAR 65 OCE	AR
FORT GIBSON	NEOSHO RIVER	CE	TD	SEP 64		MAR 65 OCE	AR
TENKILLER FERRY	ILLINOIS RIVER	CE	TD	JUL 76 F		MAR 77 SWD	
CONCHAS	CANADIAN RIVER	CE	AD	JUN 67 F		JAN 68 OCE	
SANFORD (1)	CANADIAN RIVER	BR	TD	SEP 65		FEB 66 OCE	AR
NORMAN (1)	LITTLE RIVER	BR	TD	FEB 65 F		NOV 65 OCE	
OPTIMA	N. CANADIAN RIVER	CE	TD	DEC 69		FEB 70 SWD	AR
FORT SUPPLY	WOLF CREEK	CE	TD	DEC 69		FEB 70 SWD	AR
CANTON	N. CANADIAN RIVER	CE	TD	DEC 69		FEB 70 SWD	AR
ARCADIA	DEEP FORK RIVER	CE	TD	JAN 86		JAN 86 SWD	
EUFAULA	CANADIAN RIVER	CE	TD	SEP 62 F		NOV 63 OCE	
NEWT GRAHAM PT VI, L&D 18	ARKANSAS RIVER	CE	TD	APR 72 F		JUN 72 SWD	
CHOUTEAU PT V, L&D 17	ARKANSAS RIVER	CE	TD	APR 72 F		JUN 72 SWD	
WEBBERS FALLS PT IV,L&D 16	ARKANSAS RIVER	CE	TD	JUL 72 F		JUL 72 SWD	
R.S. KERR PT III, L&D 15	ARKANSAS RIVER	CE	TD	APR 72 F		APR 72 SWD	
W.D. MAYO PT II, L&D 14	ARKANSAS RIVER	CE	TD	OCT 72		JAN 73 SWD	AR
WISTER	POTEAU RIVER	CE	TD	MAR 74 F		JUN 74 SWD	
BLUE MOUNTAIN	PETIT JEAN	CE	LRD	FEB 68 F	SEP 89 U	MAR 68 OCE	
NIMROD	FOURCHE LA FAVE	CE	LRD	SEP 67 F		MAR 68 OCE	
LOCK & DAM 13	ARKANSAS RIVER	CE	LRD	SEP 74 F	MAY 88 R	SEP 74 SWD	
OZARK-JETA TAYLOR	ARKANSAS RIVER	CE	LRD	SEP 74 F	NOV 87 R	SEP 74 SWD	
DARDANELLE	ARKANSAS RIVER	CE	LRD	MAR 76 F		APR 76 SWD	
LOCK & DAM 9	ARKANSAS RIVER	CE	LRD	MAR 76 F		APR 76 SWD	

STATUS OF WATER CONTROL MANUALS IN SWD
(Report Control Symbol DAEN-CWE-16) Revised: JANUARY 1988

RESERVOIR	STREAM	OWNER	DIST	WATER CONTROL MANUAL SUBMITTED	SCHEDULED THRU FY 90	APPROVED	
LOCK & DAM 8 TOAD SUCK FERRY	ARKANSAS RIVER	CE	LRD	JUL 74 F		SEP 74 SWD	
LOCK & DAM 7 MURRAY	ARKANSAS RIVER	CE	LRD	JUL 74 F		SEP 74 SWD	
LOCK & DAM 6 DAVID D. TERRY	ARKANSAS RIVER	CE	LRD	OCT 71 F		SEP 74 SWD	
LOCK & DAM 5	ARKANSAS RIVER	CE	LRD	OCT 71 F		SEP 74 SWD	
LOCK & DAM 4	ARKANSAS RIVER	CE	LRD	OCT 71 F		SEP 74 SWD	
LOCK & DAM 3	ARKANSAS RIVER	CE	LRD	OCT 71 F		SEP 74 SWD	
LOCK & DAM 2 (ARK POST CANAL)	ARKANSAS RIVER	CE	LRD	OCT 71 F		SEP 74 SWD	
RED RIVER MASTER		CE	TD	NOV 62		FEB 63 OCE	AR
ALTUS (1)	N. FORK RED	BR	TD	DEC 67 F		OCT 68 OCE	
MOUNTAIN PARK (1)	OTTER CREEK	BR	TD	JAN 76		MAR 76 SWD	R*
TRUSCOTT BRINE LAKE	BLUFF CREEK	CE	TD		AUG 90		
LAKE KEMP (1)	WICHITA RIVER	WCID	TD	MAY 73 F		JUN 73 SWD	
WAURIKA	BEAVER CREEK	CE	TD	APR 77 F		APR 77 SWD	
FOSS (1)	WASHITA RIVER	BR	TD	FEB 61 F		MAY 61 OCE	
FORT COBB (1)	COBB CREEK	BR	TD	JAN 60 F		MAR 61 OCE	
ARBUCKLE (1)	ROCK CREEK	BR	TD	NOV 66		SEP 67 OCE	AR
TEXOMA	RED RIVER	CE	TD	JUN 75 F		APR 84 SWD	
PAT MAYSE	SANDERS CREEK	CE	TD	DEC 66 F		OCT 67 OCE	
SARDIS	JACKFORK CREEK	CE	TD	JAN 84 F		AUG 84 SWD	
MCGEE CREEK (1)	MUDDY BOGGY CREEK	BR	TD	JUL 85	MAR 88	MAY 87 SWD	AR
HUGO	KIAMICHI RIVER	CE	TD	MAY 82		JUL 82 SWD	AR
LITTLE RIV SYS							
PINE CREEK	LITTLE RIVER	CE	TD	MAY 74		JUL 74 SWD	AR
BROKEN BOW	MOUNTAIN FORK	CE	TD	JUL 74 F		NOV 74 SWD	
DEQUEEN	ROLLING FORK	CE	LRD	MAY 76 F		JUN 76 SWD	R
GILLHAM	COSSATOT RIVER	CE	LRD	MAR 67 F		JUL 86 SWD	
DIERKS	SALINE RIVER	CE	LRD	JUN 75 F		APR 76 SWD	
MILLWOOD	LITTLE RIVER	CE	TD	SEP 73 F		NOV 73 SWD	

STATUS OF WATER CONTROL MANUALS IN SWD
(Report Control Symbol DAEN-CWE-16) Revised: JANUARY 1988

RESERVOIR	STREAM	OWNER	DIST	WATER CONTROL MANUAL SUBMITTED	SCHEDULED THRU FY 90	APPROVED
SULPHUR RIV MASTER		CE	FWD		SEP 89	
COOPER	SULPHUR RIVER	CE	FWD		OCT 89	NOV 74 LMVD
WRIGHT PATMAN	SULPHUR RIVER	CE	FWD	SEP 74 U		NOV 74 LMVD
LAKE O' THE PINES	CYPRESS CREEK	CE	FWD	JUN 74 U		
NECHES RIV MASTER		CE	FWD	MAY 62		MAR 63 OCE AR
B. A. STEINHAGEN	NECHES RIVER	CE	FWD	JUL 51		FEB 63 OCE AR
SAM RAYBURN	ANGELINA RIVER	CE	FWD	JAN 73 R	JAN 90	FEB 73 SWD AR
TRINITY RIV MASTER		CE	FWD	MAY 75 P	JAN 89	MAY 75 SWD
BENBROOK	CLEAR FORK	CE	FWD	MAY 75 P		MAY 75 SWD
JOE POOL	MOUNTAIN CREEK	CE	FWD	DEC 85 P	MAR 89	JAN 86 SWD AR
RAY ROBERTS	ELM FORK	CE	FWD	JUL 85	APR 89	JAN 86 SWD AR
LEWISVILLE	ELM FORK	CE	FWD	MAY 75 P	JUL 90	MAY 75 SWD
GRAPEVINE	DENTON CREEK	CE	FWD	MAY 75 P	MAY 89	MAY 75 SWD
LAVON	EAST FORK	CE	FWD	MAY 75 P	SEP 90	MAY 75 SWD
NAVARRO MILLS	RICHLAND CREEK	CE	FWD	MAY 63	AUG 88	JUL 64 OCE AR
BARDWELL	WAXAHACIE CREEK	CE	FWD	AUG 63	JUL 88	JUL 65 OCE AR
WALLISVILLE	TRINITY RIVER	CE	GD			
BUFFALO BAYOU MASTER		CE	GD			
BARKER	BUFFALO BAYOU	CE	GD	MAY 63 F		OCT 72 SWD R
ADDICKS	BUFFALO BAYOU	CE	GD	MAY 63 F		OCT 72 SWD R
BRAZOS RIV MASTER		CE	FWD	JAN 73	JUN 90	MAR 73 SWD R*
WHITNEY	BRAZOS RIVER	CE	FWD	JAN 74 F		APR 75 SWD
AQUILLA	AQUILLA CREEK	CE	FWD	AUG 83 P	JAN 88	MAY 84 SWD AR
PROCTOR	LEON RIVER	CE	FWD	FEB 74 F		APR 74 SWD
BELTON	LEON RIVER	CE	FWD	APR 76 F		MAY 76 SWD
STILLHOUSE HOLLOW	LAMPASAS RIVER	CE	FWD	MAY 76 F		JUL 76 SWD
GEORGETOWN	N.F.SAN GABRIEL	CE	FWD	DEC 79 P	JUN 88	JUN 80 SWD R
GRANGER	SAN GABRIEL	CE	FWD	OCT 82	FEB 88	NOV 82 SWD R

STATUS OF WATER CONTROL MANUALS IN SWD
(Report Control Symbol DAEN-CWE-16) Revised: JANUARY 1988

RESERVOIR	STREAM	OWNER	DIST	WATER CONTROL MANUAL SUBMITTED	SCHEDULED THRU FY 90	APPROVED	
WACO	BOSQUE RIVER	CE	FWD	JUL 73 F		AUG 73 SWD	
SOMERVILLE	YEGUA CREEK	CE	FWD	OCT 73 F		NOV 73 SWD	
COLORADO RIV MASTER		CE	FWD				
HORDS CREEK	HORDS CREEK	CE	FWD	SEP 55		MAY 62 OCE	AR
O.C. FISHER	N. CONCHO	CE	FWD	JAN 56		DEC 62 OCE	AR
TWIN BUTTES (1)	S. CONCHO	BR	FWD	JAN 66 P	SEP 89	SEP 66 FR	
MARSHALL FORD (1)	COLORADO RIVER	BR	FWD	DEC 79	SEP 88	MAY 80 SWD	R/FR
GUADALUPE RIV MASTER		CE	FWD	OCT 63		JAN 66 OCE	AR
CANYON	GUADALUPE RIVER	CE	FWD	MAR 73 F		MAY 73 SWD	
RIO GRANDE MASTER		CE	AD	AUG 66 F		FEB 67 OCE	
ABIQUIU	RIO CHAMA	CE	AD	APR 82 U	SEP 90 U	JUN 82 SWD	
COCHITI	RIO GRANDE	CE	AD	AUG 78 F	JAN 89 U	JUN 81 SWD	
GALISTEO	GALISTEO CREEK	CE	AD	MAR 68 F		APR 68 OCE	
JEMEZ CANYON	JEMEZ RIVER	CE	AD	AUG 66 F		AUG 84 SWD	R*
PLATORO (1)	CONEJOS RIVER	BR	AD	APR 64 F	SEP 89 U	MAY 64 OCE	
PECOS RIV MASTER		CE	AD	NOV 77		NOV 77 SWD	AR
SANTA ROSA	PECOS RIVER	CE	AD	DEC 79 F		SEP 81 SWD	
SUMNER (1)	PECOS RIVER	BR	AD	MAR 82	MAY 88 R	JUL 84 SWD	AR
TWO RIVERS	RIO HONDO	CE	AD	JUN 62 F		JUN 64 OCE	
BRANTLEY (1)	PECOS RIVER	CE	AD		DEC 87		
NAVAJO (1)	SAN JUAN RIVER	BR	AD		SEP 90 U	JUN 70 OCE	

NOTES:

(1) - Section 7 project, flood control regulation by CE.
AR - Approved, comments to be answered.
F - Complete, comments have been answered and approved.
FR - Published in Federal Register.
P - Plan.
R - Revision or answer to comments.
R* = Returned without approval.
U = Update of existing approved manual.
GRDA = Grand River Dam Authority.
WCID = Wichita County Water Improvement District.
LCRA = Lower Colorado River Authority.
BR = Bureau of Reclamation.

SECTION V - REGULATION OF MULTI-PURPOSE PROJECTS WITH HYDROPOWER

SECTION V
HYDROPOWER GENERATION AT SOUTHWESTERN DIVISION PROJECTS

The 17 Hydropower Projects are listed in Table 1. Generation by project for the last five fiscal years are shown in Table 2. Also, generation by the projects, since impoundment, is shown on the following graphs.

TABLE 1

Projects	Basin	Stream	No. Units	Total Capacity MW	Plate No.
Beaver	White	White	2	112	1
Table Rock	White	White	4	200	2
Bull Shoals	White	White	6	340	3
Norfork	White	North Fork	2	70	4
Greers Ferry	White	Little Red	2	96	5
Keystone	Arkansas	Arkansas	2	70	6
Ft. Gibson	Arkansas	Grand	4	45	7
Webbers Falls	Arkansas	Arkansas	3	60	8
Tenkiller Ferry	Arkansas	Illinois	2	34	9
Eufaula	Arkansas	S. Canadian	3	90	10
R.S. Kerr	Arkansas	Arkansas	4	110	11
Ozark-Jeta Taylor	Arkansas	Arkansas	5	100	12
Dardanelle	Arkansas	Arkansas	4	124	13
Denison	Red	Red	2	70	14
Broken Bow	Red	Mountain Fork	2	100	15
Sam Rayburn	Neches	Angelina	2	52	16
Whitney	Brazos	Brazos	2	30	17

TABLE 2

Fiscal Years
(1.000 GWH)

	1983	1984	1985	1986	1987
Beaver	173.2	116.3	222.5	214.5	155.1
Table Rock	680.2	471.2	886.0	645.9	432.2
Bull Shoals	1084.8	697.1	1397.9	875.0	566.8
Norfork	260.9	209.7	396.1	214.7	126.5
Greers Ferry	344.8	158.3	315.8	148.9	105.7
Keystone	231.2	234.4	306.5	333.0	500.9
Ft. Gibson	216.2	203.6	321.8	294.9	286.7
Webbers Falls	91.9	190.3	320.7	350.9	286.9
Tenkiller Ferry	94.8	78.3	176.3	174.1	147.5
Eufaula	239.5	195.1	360.0	336.1	461.2
R.S. Kerr	577.9	526.5	750.7	725.8	772.9
Ozark-Jeta Taylor	134.7	193.2	437.1	488.0	341.1
Dardanelle	656.9	595.8	823.5	799.6	830.1
Denison	188.6	198.9	343.0	294.5	533.2
Broken Bow	194.7	139.5	229.6	147.4	93.9
Sam Rayburn	174.6	125.3	97.8	105.6	147.4
Whitney	28.5	15.0	57.1	50.8	109.9

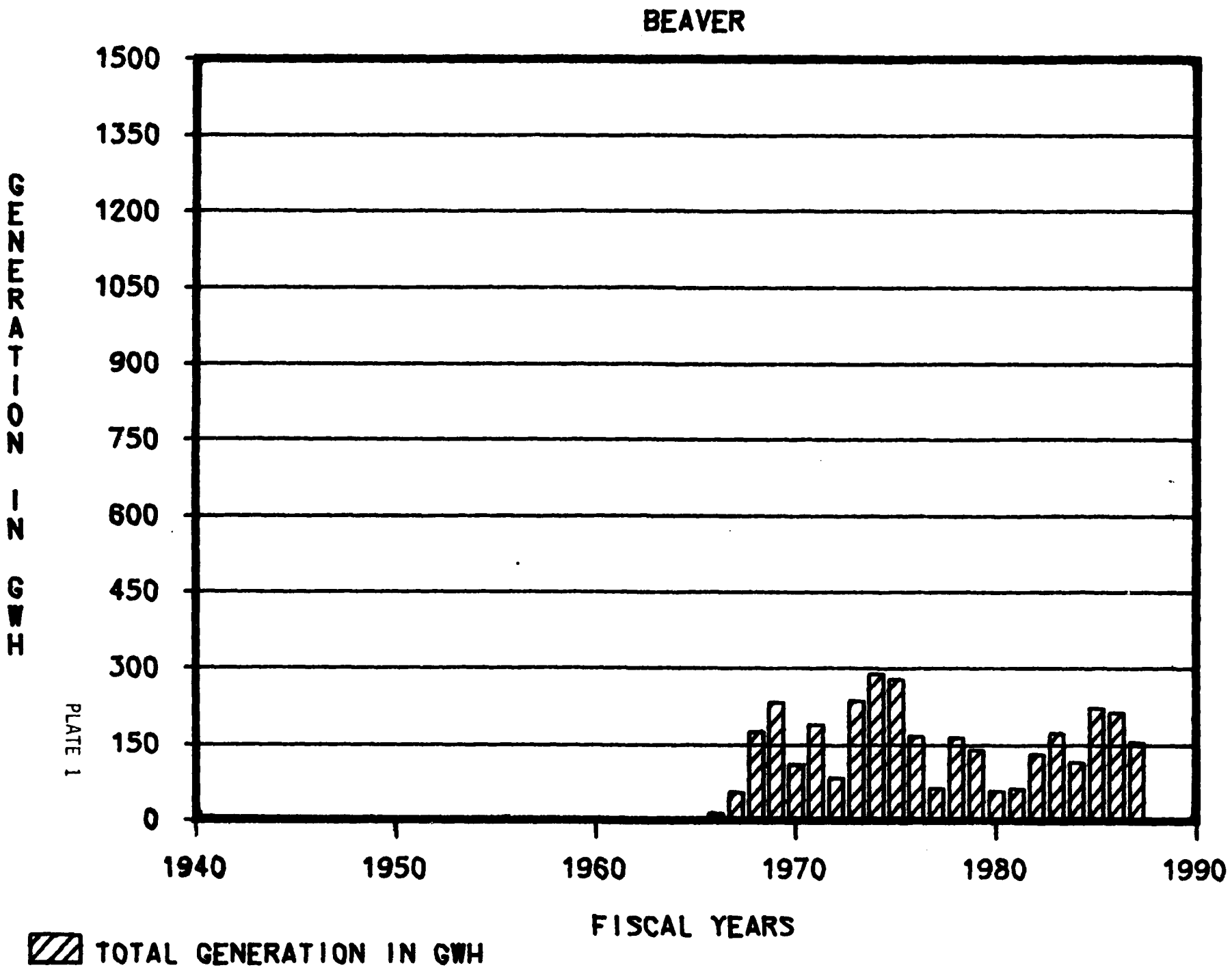
BEAVER
1500
1350
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 1

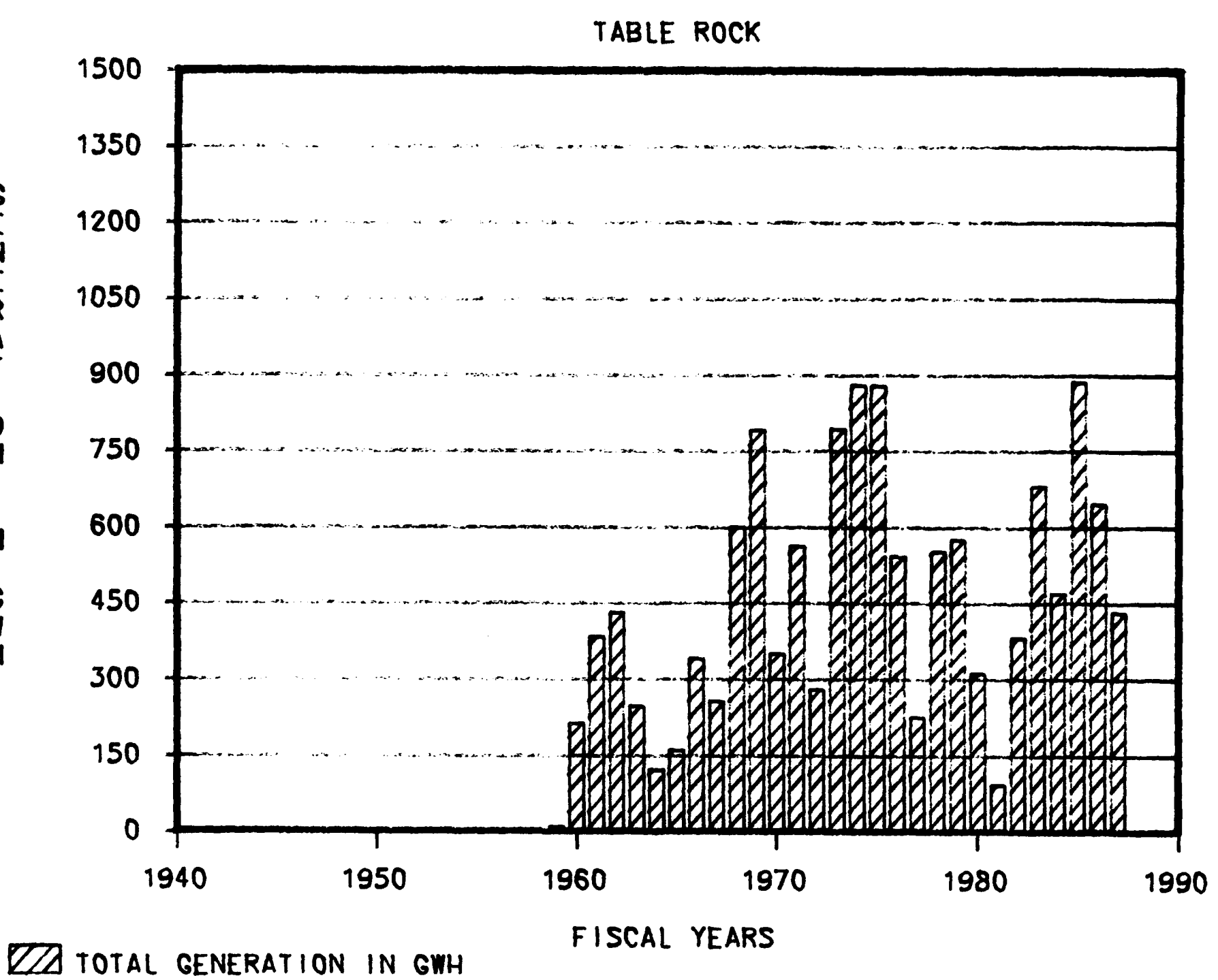
TABLE ROCK
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1350
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 2

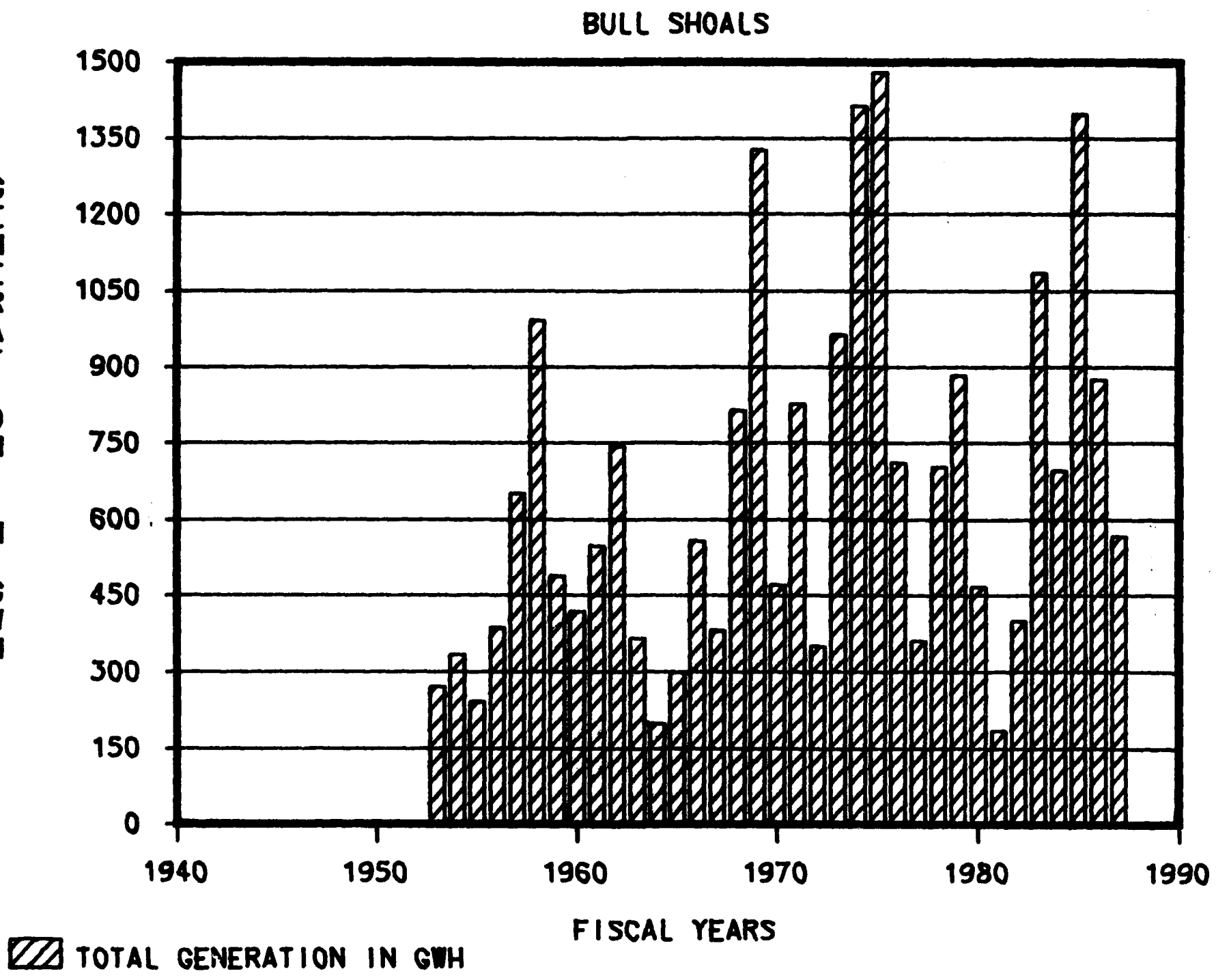
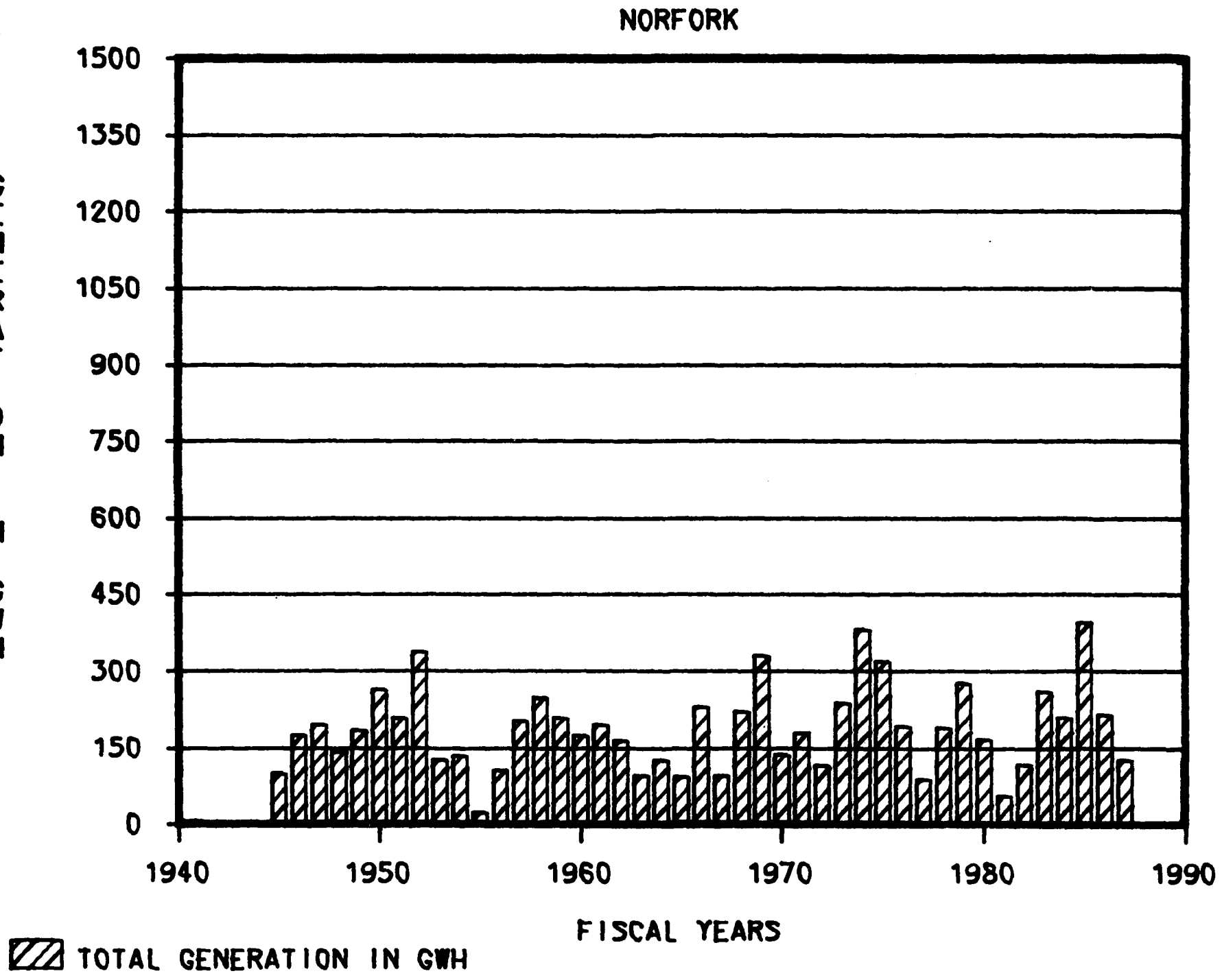

BULL SHOALS
GENERATION IN GWH
1500
1350
1200
1050
900
750
600
450
300
150
0
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 3


NORFORK
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1200
1050
900
750
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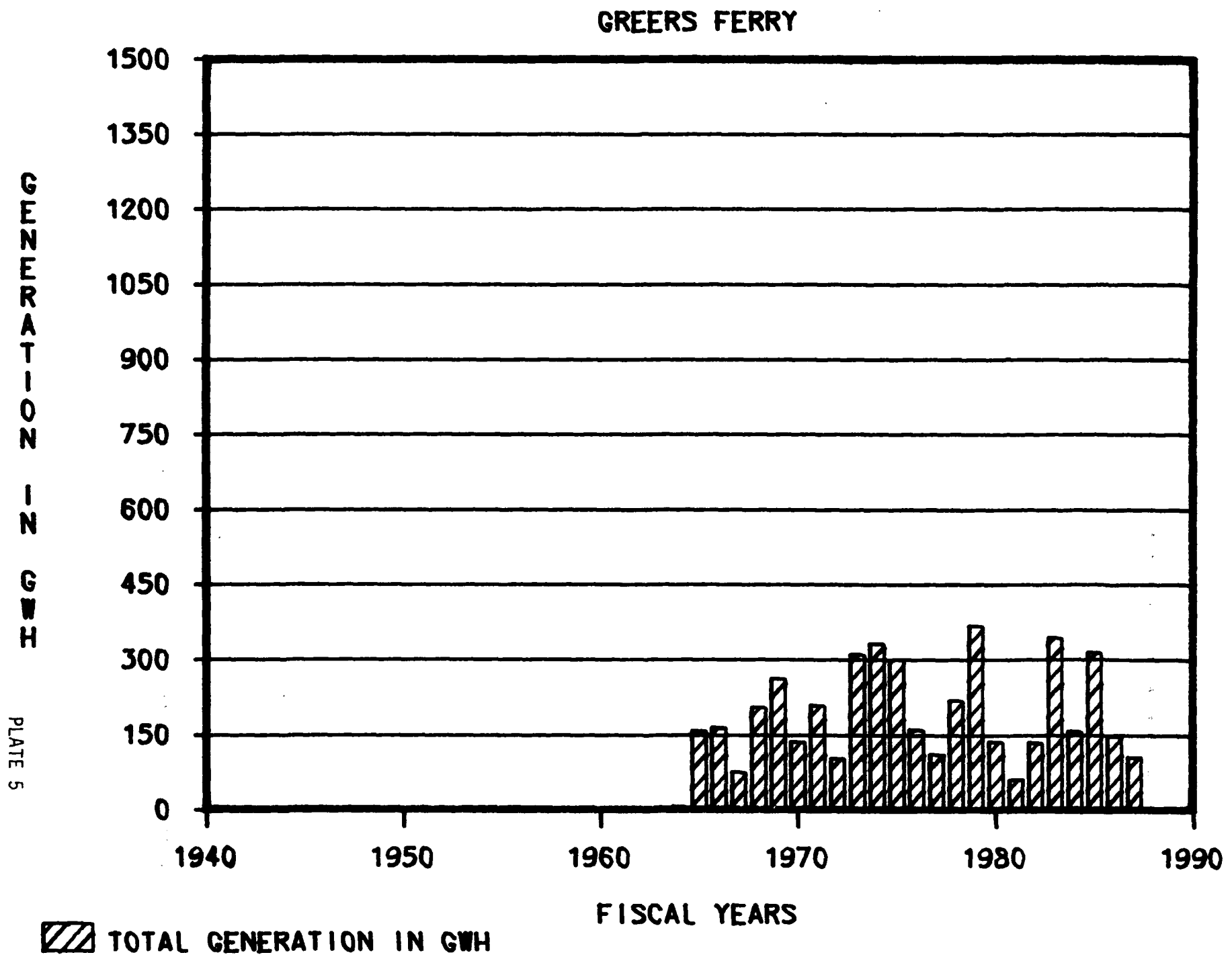
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 4


GREERS FERRY
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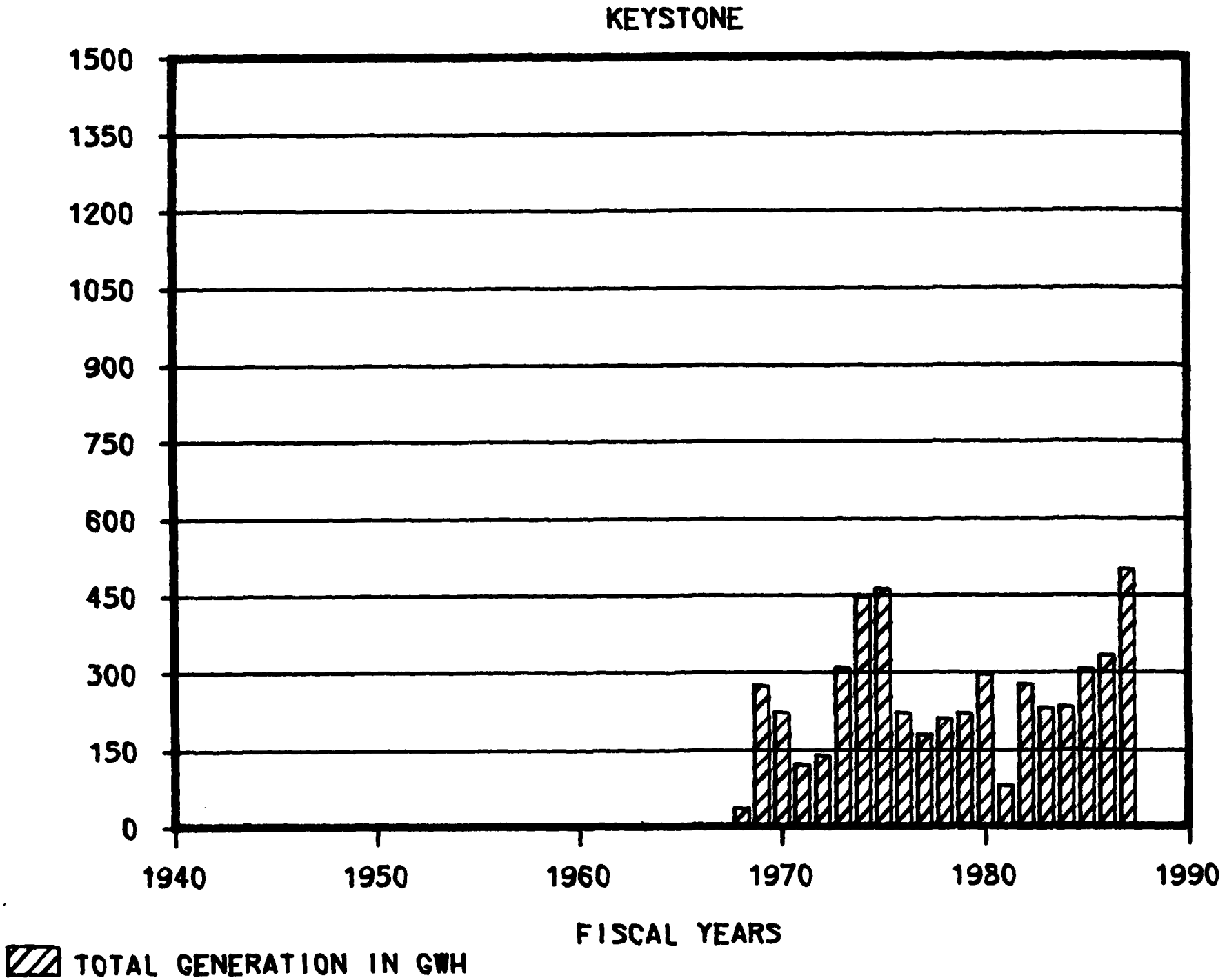
1350
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 5


KEYSTONE
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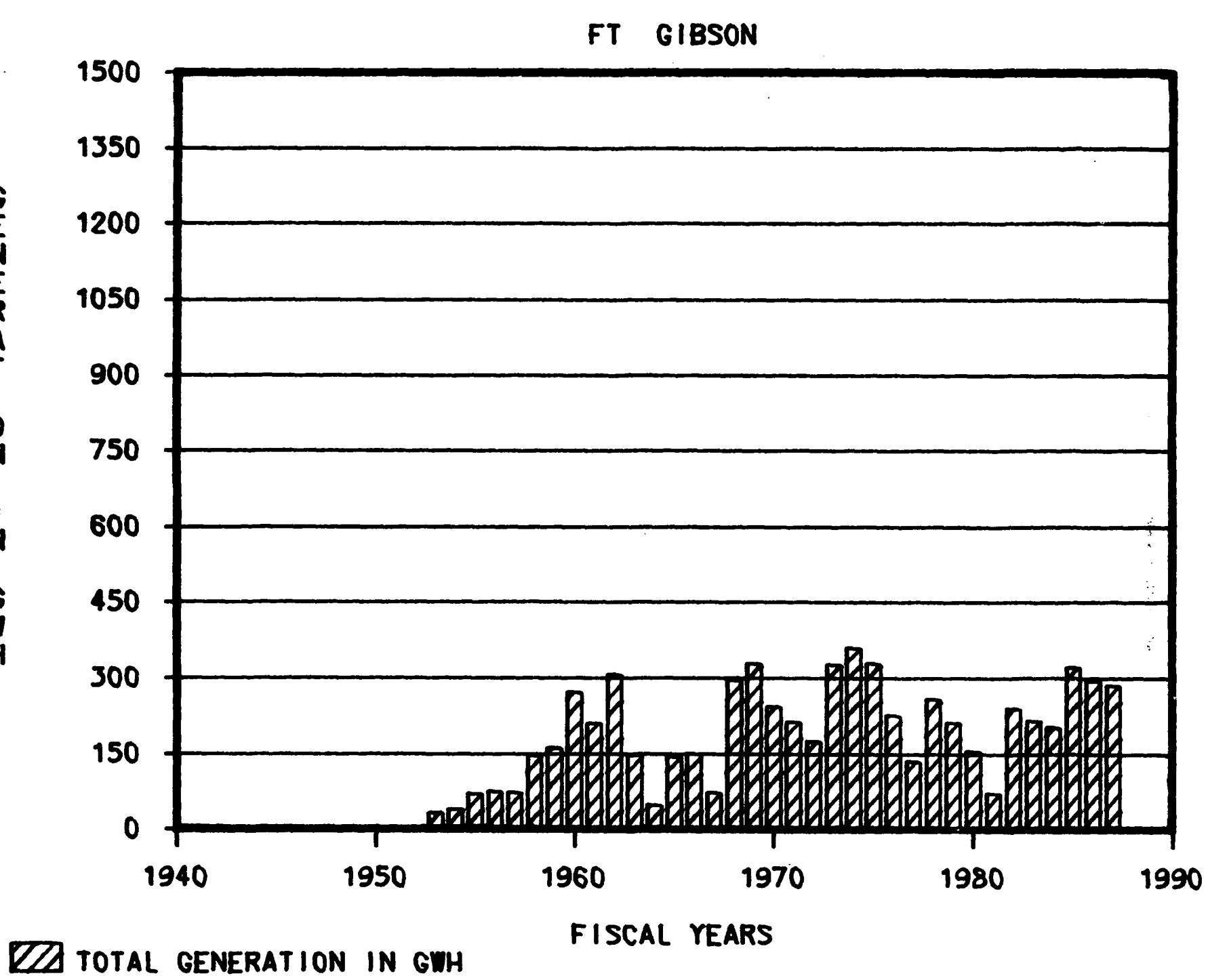
1350
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 6


FT GIBSON
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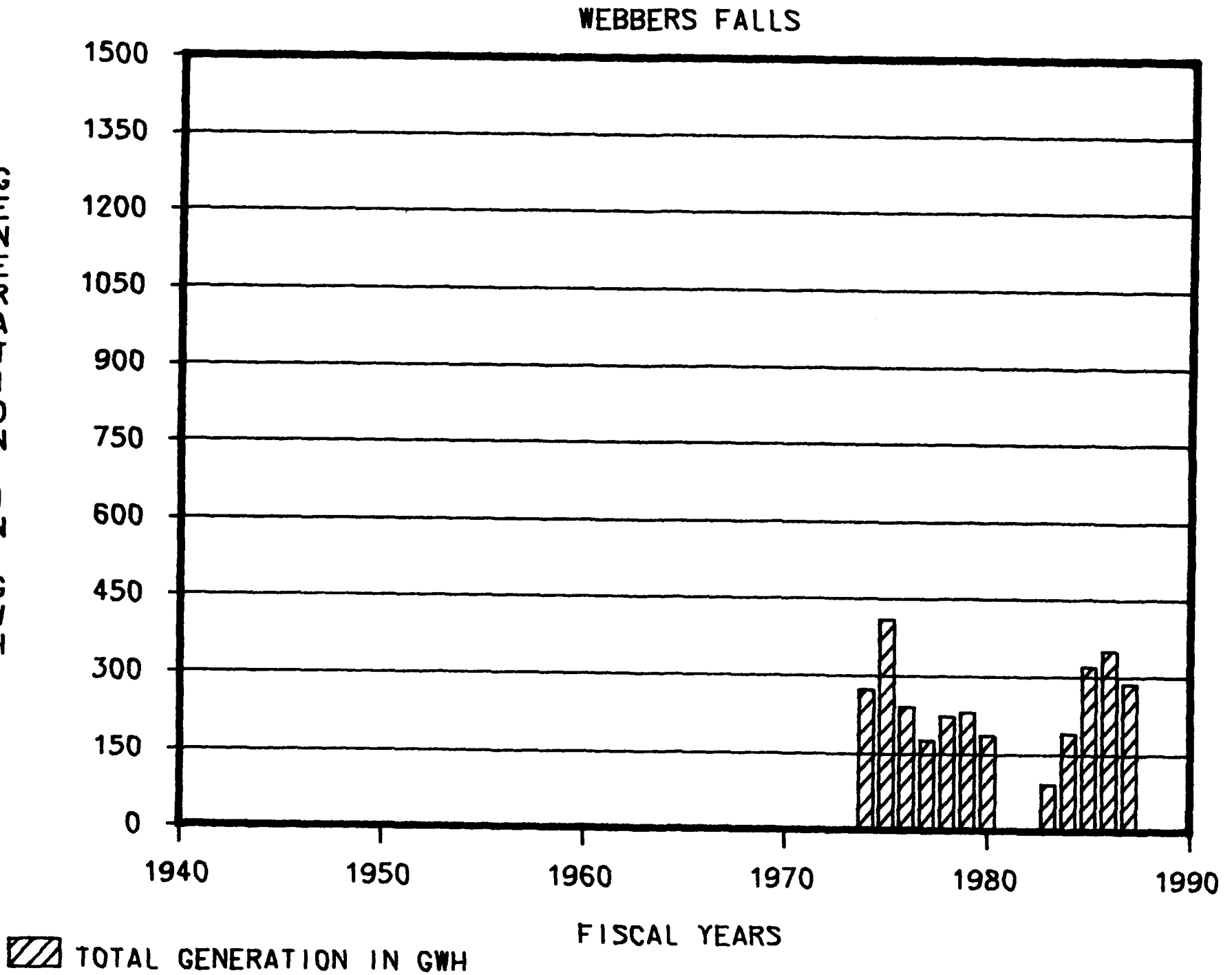
1350
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 7


WEBBERS FALLS
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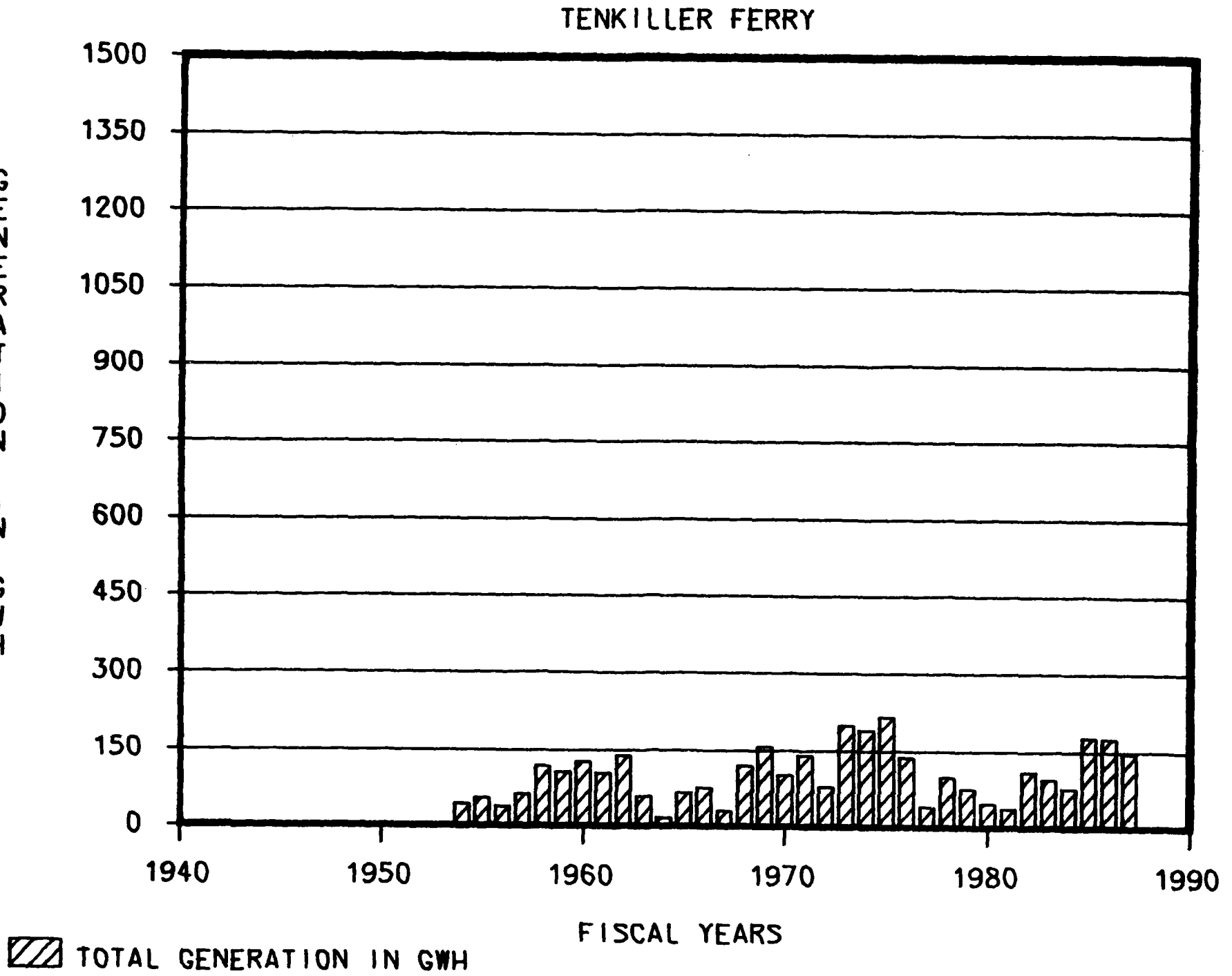
1350
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 8


TENKILLER FERRY
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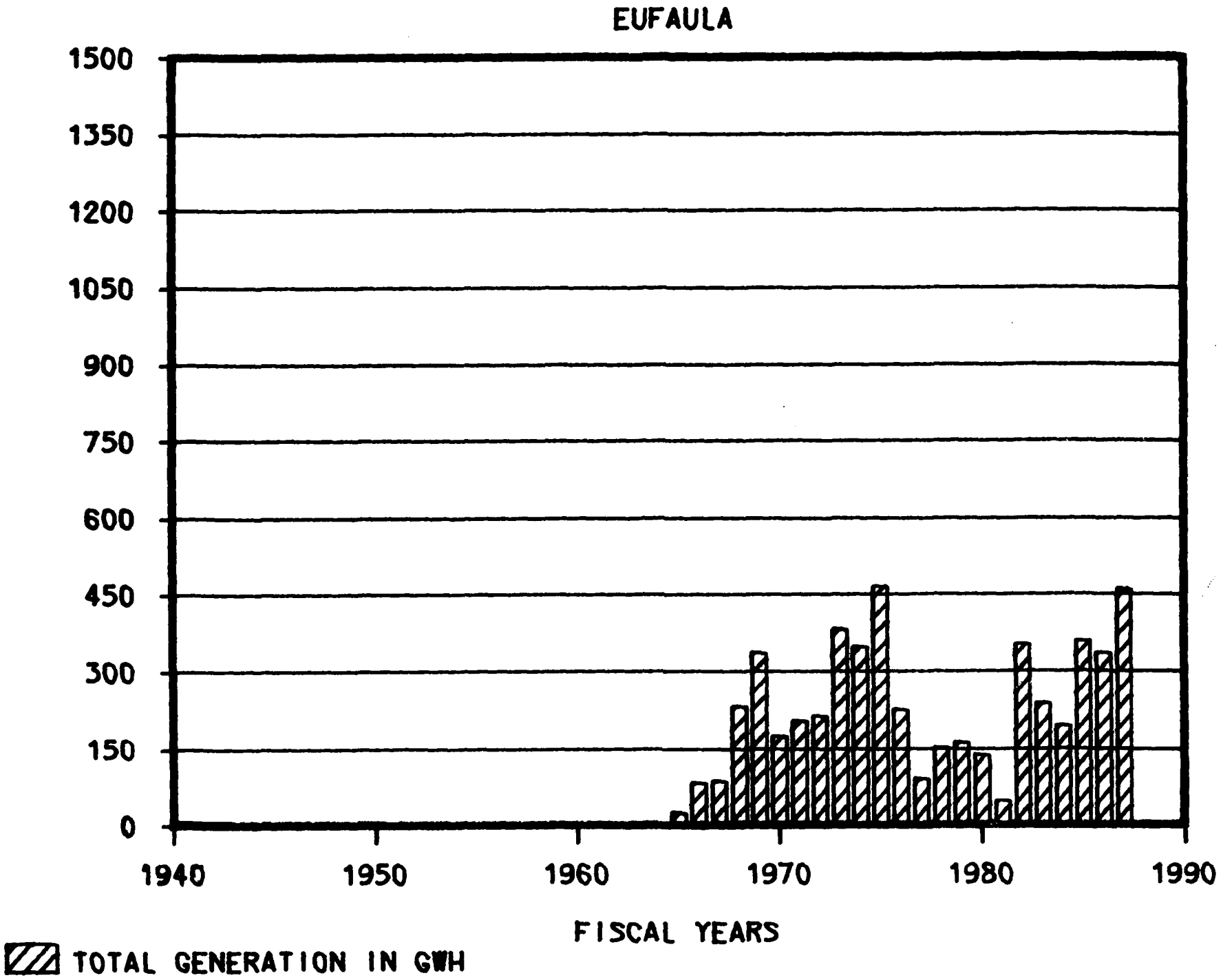
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 9


EUFAULA
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1350
1200
1050
900
750
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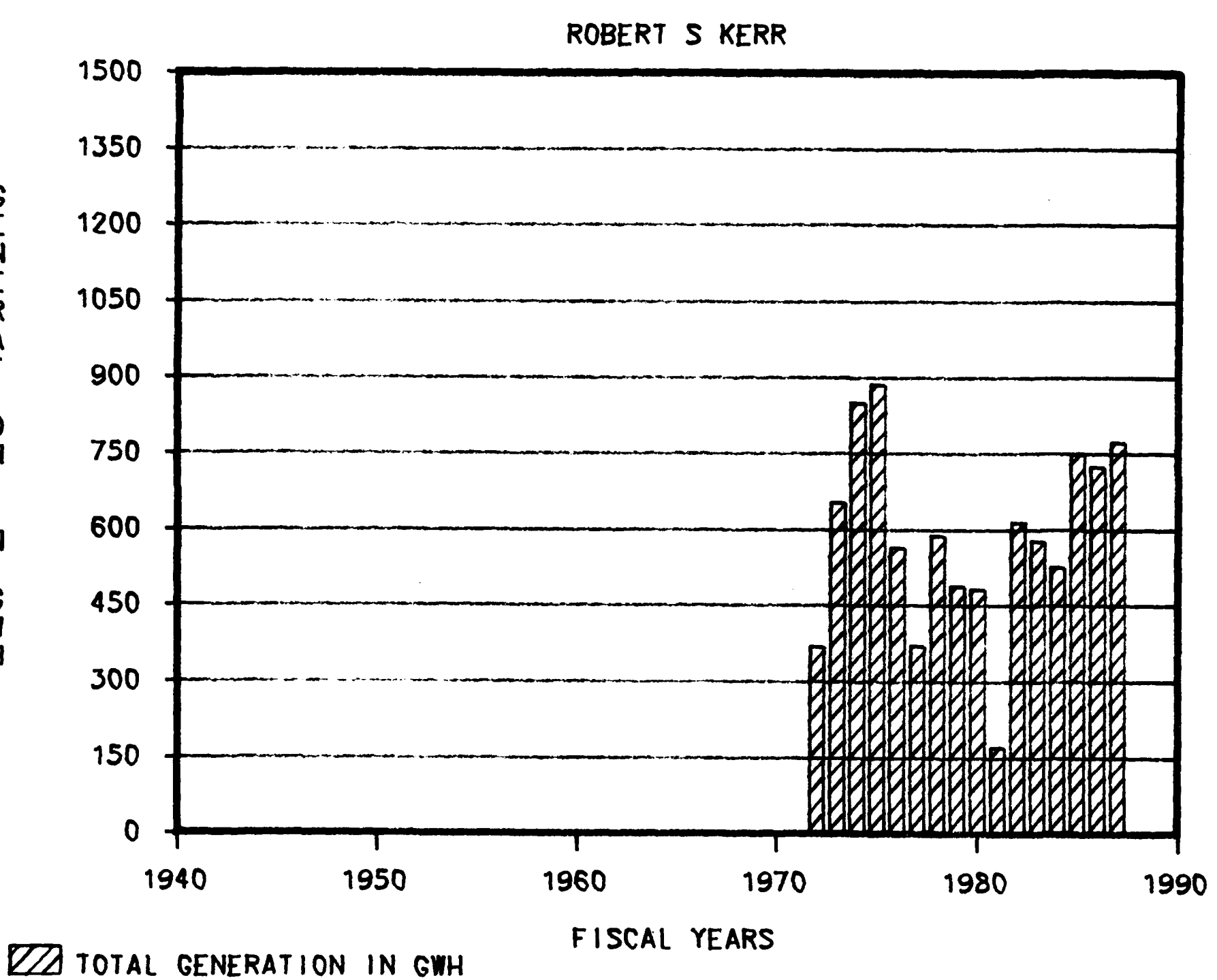
150
0
GENERATION - IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 10


ROBERT S KERR
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1350
1200
1050
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750
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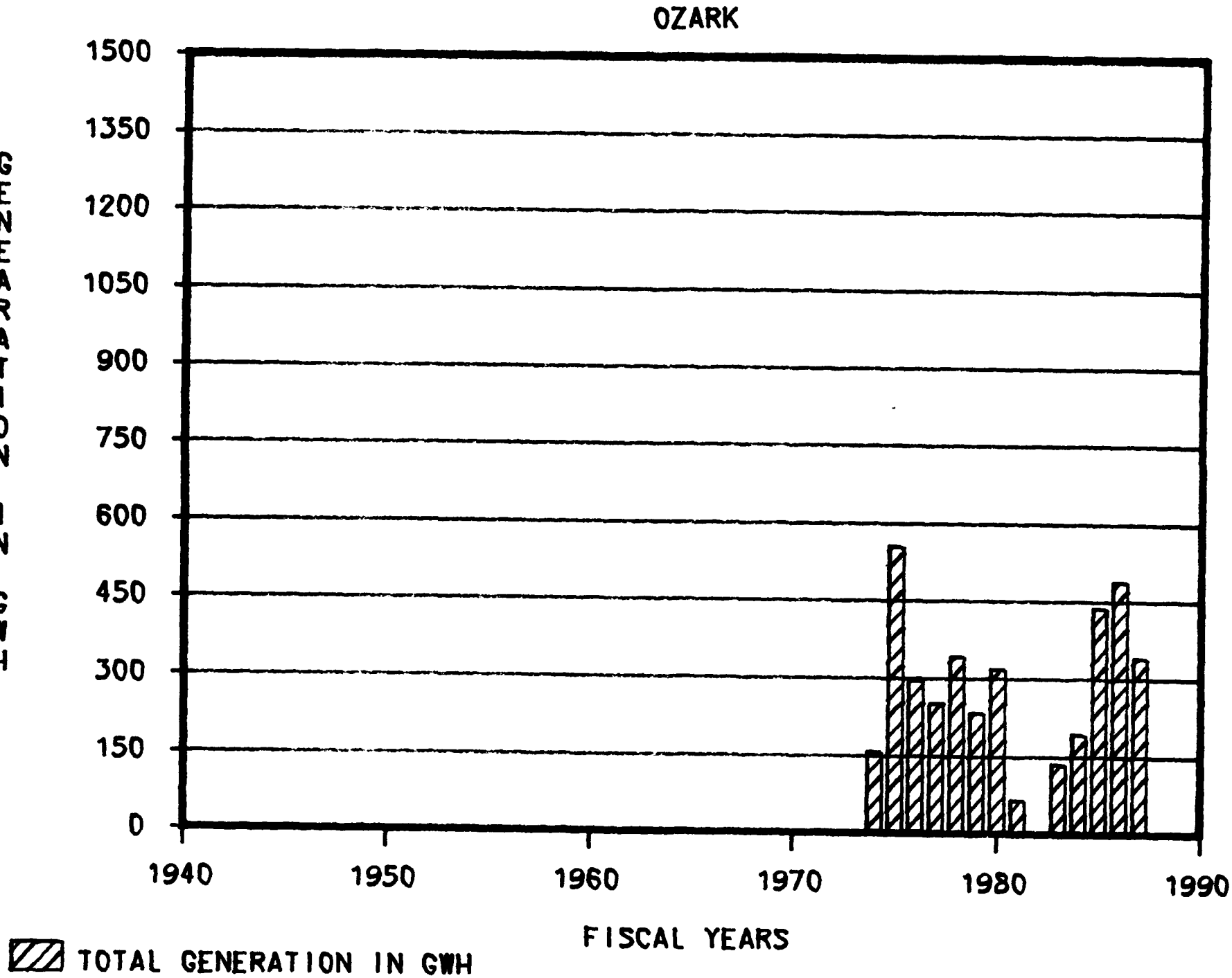
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 11


OZARK
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1200
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750
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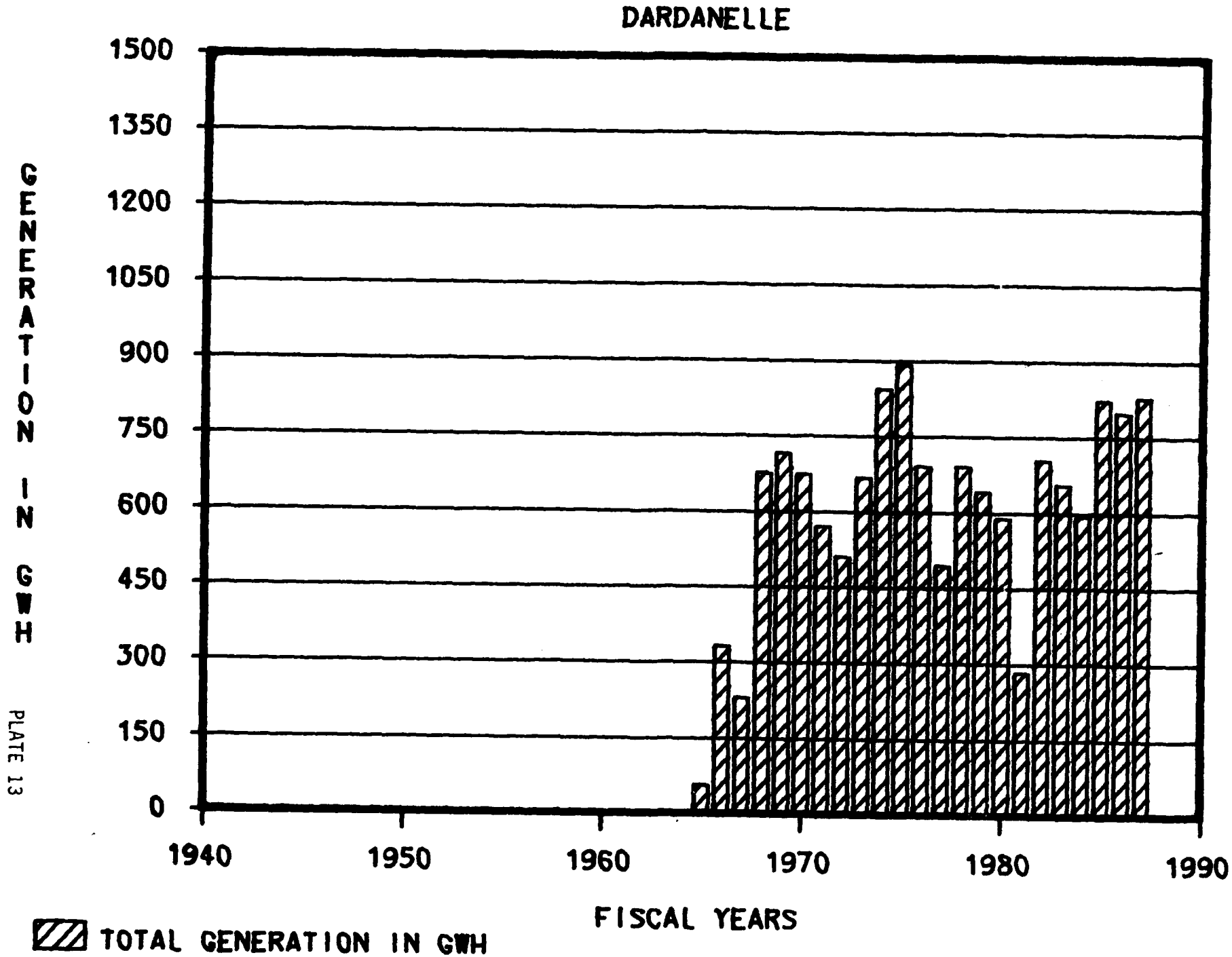
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 12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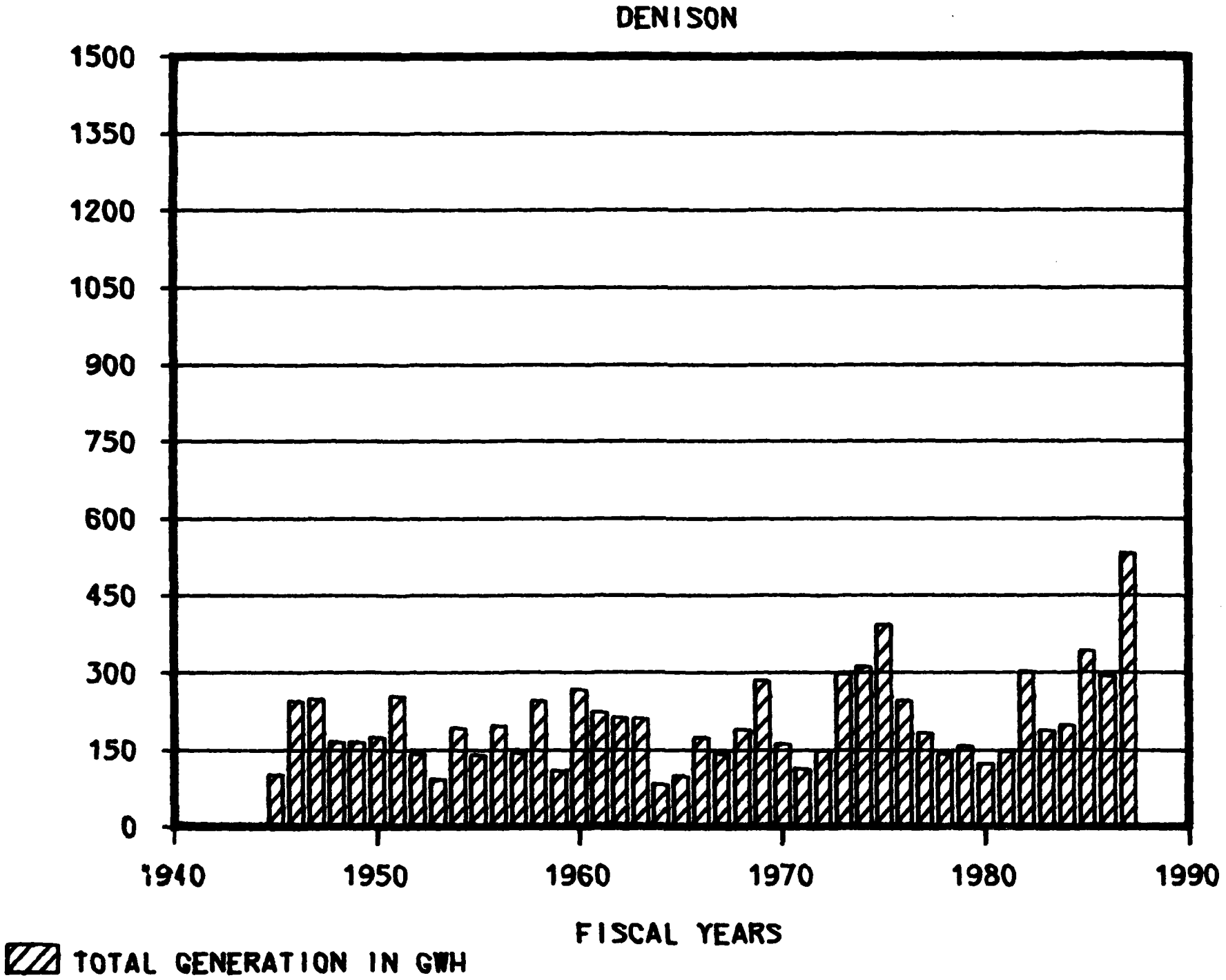
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 13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1500
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1200
1050
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0
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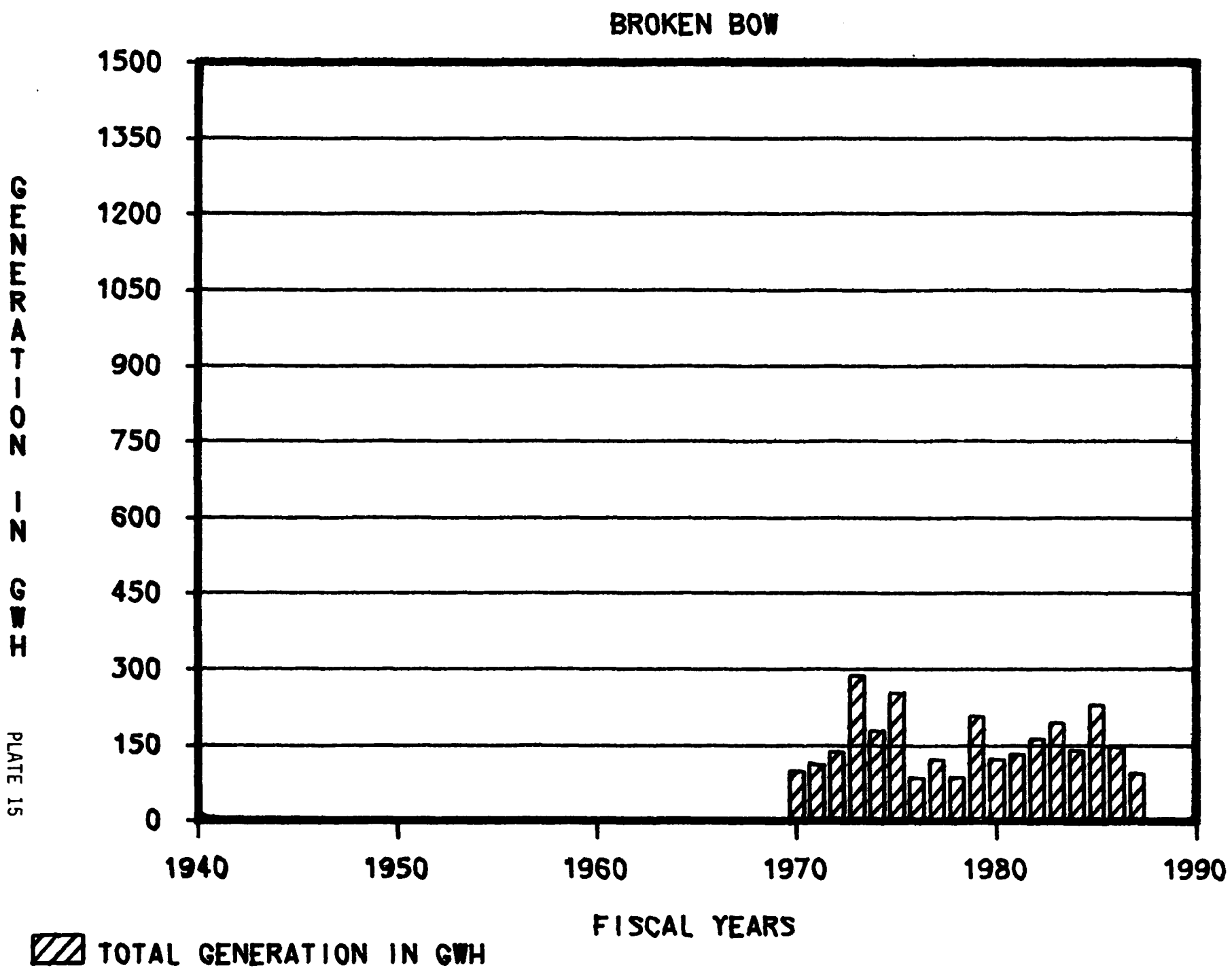
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 14


BROKEN BOW
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1350
1200
1050
900
750
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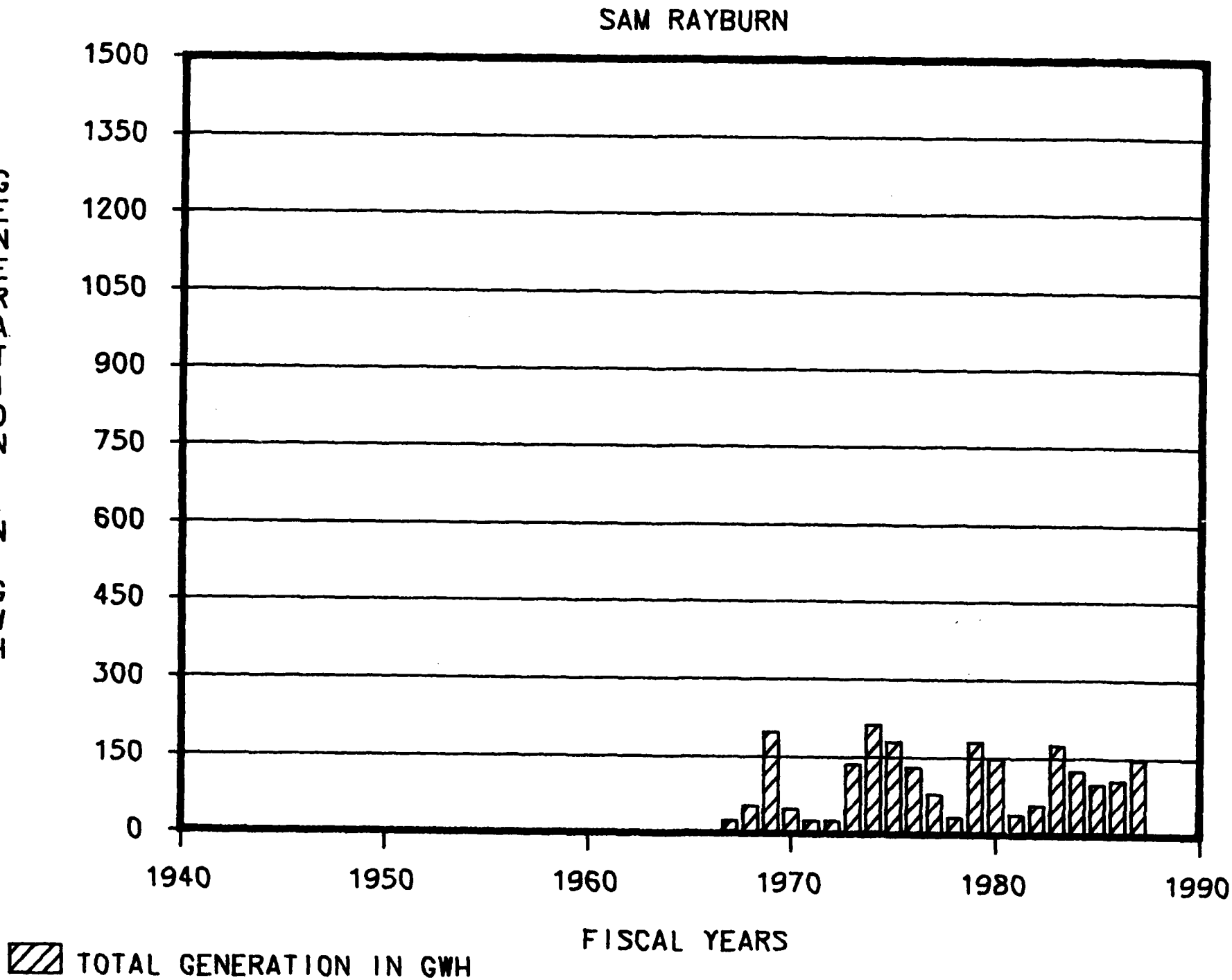
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 15


SAM RAYBURN
1500
1350
1200
1050
900
750
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GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 16

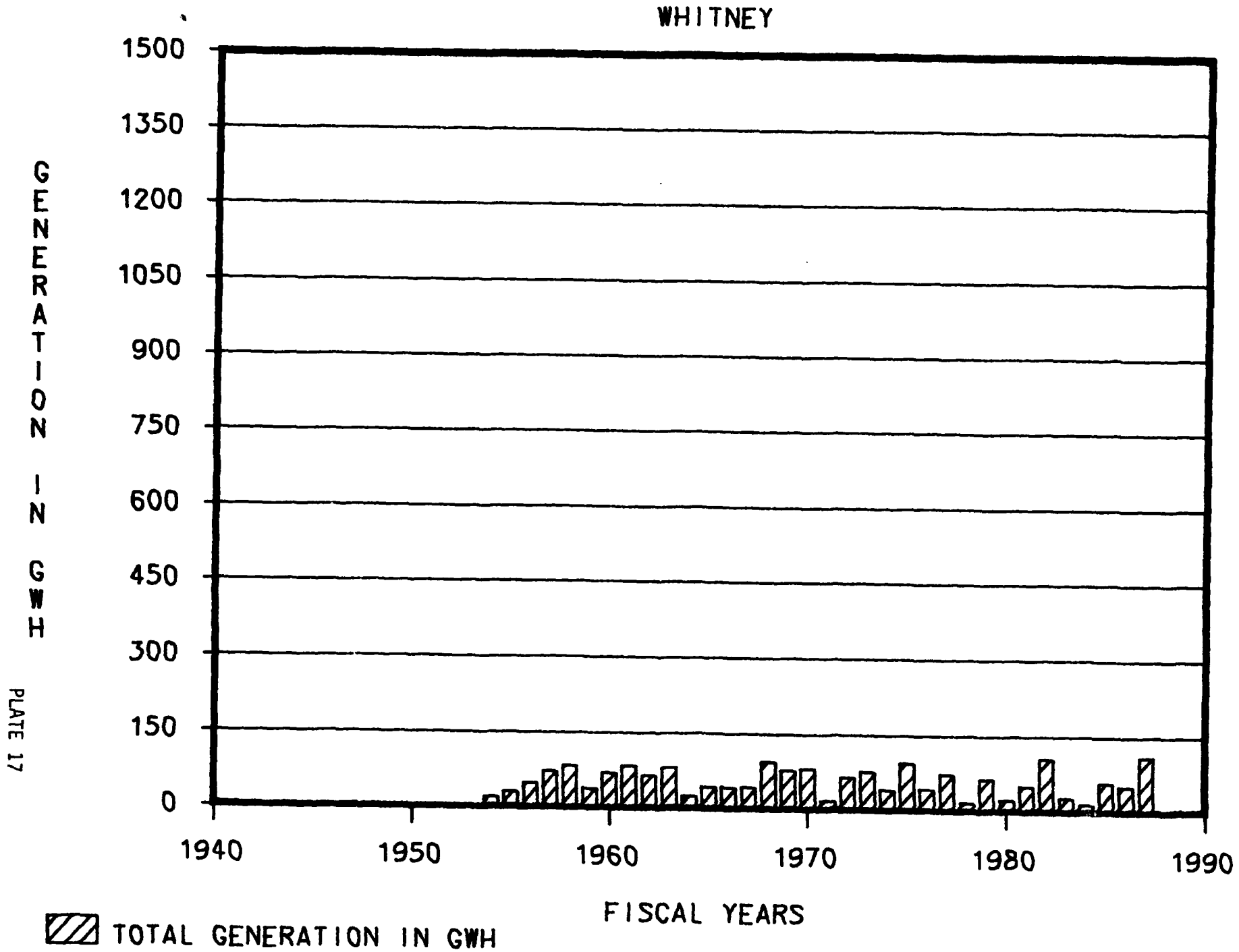

WHITNEY
1500
1350
1200
1050
900
750
600
450
300
150
0
GENERATION IN GWH
1940
1950
1960
1970
1980
1990
FISCAL YEARS
TOTAL GENERATION IN GWH

PLATE 17

SECTION VI - DISTRICT WATER CONTROL ACTIVITIES

SECTION VI - DISTRICT WATER CONTROL ACTIVITIES

SECTION VI - DISTRICT WATER CONTROL ACTIVITIES

1. PROJECT VISITATION BY WATER MANAGEMENT PERSONNEL

a. ALBUQUERQUE DISTRICT. During FY 1987, Abiquiu, Brantley, Conchas, Navajo, Platoro, Santa Rosa, Sumner, and Trinidad Projects were visited by Reservoir Regulation Personnel.

b. FORT WORTH DISTRICT. Eleven of the twenty-four District reservoir projects were visited by Water Management personnel during FY 1987. Joe Pool and Benbrook Dams were visited in November 1986, Granger and Georgetown Dams were visited in March 1987, Bardwell and Navarro Mills Dams were visited in June 1987, Canyon, Belton, and Stillhouse Hollow Dams were visited in July 1987, and Ray Roberts Dam was visited in August 1987. Water Control Manuals, flood control and emergency operations procedures, gate operations and gate calibration, potential flooding areas, shoreline and downstream erosion, impacts of project operations, and the WCDS data collection and dissemination were discussed with the project personnel during these visits.

c. GALVESTON DISTRICT. On 17 August 1987, Hydrology and Hydraulics personnel visited the Addicks Project Office to participate in a field inspection of: The construction of the Cinco Ranch diversion channel along with the channel improvements to Buffalo Bayou and the raising of the Addicks and Barker dam embankments. Operational procedures were also reviewed with project personnel.

d. LITTLE ROCK DISTRICT.

(1) Project visitation got off to a fast start in October due to the large rise on the Arkansas River. The system engineer for the Arkansas River along with representatives of the Planning Division toured the flooded areas of the basin. A low lying fog restricted the viewing of the flooding in the immediate Ft. Smith area, and to the area around Winthrop Rockefeller Lake. Representatives of the Arkansas congressional offices were briefed by the Reservoir Control Section on a later flight over the entire upper river during this same October event. Other project visitations during the flood was limited because the section was operating on a 24 hour basis.

(2) Later in the year, three of the section personnel accompanied the District streamgaging personnel during on-site inspections of some of the gaging and data collection platform (DCP) equipment used in regulating the Arkansas River projects. Two of the visits were at MW-5 near the confluence with the Mississippi River, and one was at Toad Suck Ferry.

(3) In the summer, a visit was conducted to observe the area at Pool 6 between Little Rock and the new slack water harbor just completed. This trip was taken on the Arkoma, the District inspection boat. The Arkansas River system engineer also observed the military vehicle testing below Trimble Lock & Dam for which special flow rates were coordinated to vary the river current coniditons. During this visit he met with project personnel and Waterways Experiment Station personnel who were in charge of testing.

(4) The White River engineer spent a week visiting the Bull Shoals and Norfork projects. The visit included a tour of the powerhouse facility, the Norfork Fish Hatchery, and several of the boat dock leases. Earlier in the year another visit had been conducted at Table Rock in conjunction with representatives of the United States Geological Survey (USGS) to establish a site for the new dissolved oxygen monitoring station immediately downstream of the powerhouse tailrace. This monitor was installed in the summer.

(5) Two reservoir control personnel accompanied the streamgaging personnel on inspection of the DCP and the gaging equipment in the Little River area. These visits included both Millwood and the Tri-Lakes. At Gillham they viewed the gates which were overhauled last year and assisted in taking a wire weight reading of the elevation. At Millwood they met with the resident engineer and his staff and discussed the water management issues pertinent to their current operation.

e. TULSA DISTRICT. Twenty-one project sites were visited by Reservoir Control Section personnel this fiscal year. The projects visited and purposes for the visits are listed in the following table.

PROJECT VISITATION
DURING
FISCAL YEAR 1987

PROJECT	PURPOSE OF VISIT
Arcadia	Site familiarization and training presentation.
Big Hill	Stilling Basin Inspection.
Canton	Periodic inspection.
Elk City	Outlet channel inspection.
Eufaula	Scheduled reservoir control visit.
Fort Cobb	Aerial Reconnaissance.

PROJECT VISITATION
DURING
FISCAL YEAR 1987

(Con't)

PROJECT	PURPOSE OF VISIT
Great Salt Plains	Period Inspection.
Kemp	Aerial reconnaissance and annual inspection of structures.
Keystone	Scheduled reservoir control visit.
Copan	Scheduled reservoir control visit.
Oologah	Scheduled reservoir control visit.
Pat Mayse	Periodic Inspection.
Robert S. Kerr	Scheduled reservoir control visit.
Sardis	Periodic Inspection.
Tenkiller	Scheduled reservoir control visit.
Tom Steed	Scheduled reservoir control visit.
Waurika	Aerial Reconnaissance.
W. D. Mayo	Scheduled reservoir control visit.
Webbers Falls	Scheduled reservoir control visit.
Wister	Scheduled reservoir control visit.

2. SPECIAL RESERVOIR OPERATIONS.

a. ALBUQUERQUE DISTRICT. FY 1987 was a very busy year for reservoir regulation activities in the Albuquerque District. All of the major river basins in the District had flood control operations during the spring snowmelt runoff, which resulted in 6 projects that either reached or exceeded previous record pool elevations. These activities and other regulations resulted in 16 deviations during the year.

The Rio Grande Basin observed about 200 percent of normal runoff as recorded at the Otowi gage above Cochiti Lake. The three major projects above Albuquerque, NM combined to control releases in the Rio Grande and all had resulting record pool elevations.

Jemez Canyon Reservoir began storing spring runoff on 3 April and reached a record pool elevation of 5,220.30 (72,254 ac-ft) on 2 June.

Abiquiu Reservoir began storing snowmelt runoff on 12 April and reached a record pool elevation of 6,261.06 (402.258 ac-ft) on 22 June. Water that would have been held as carry-over storage during the summer was and is being delivered to Cochiti Lake. This transfer provided for an evacuation of all flood water by 30 November 1987 to enable the construction of the Los Alamos County hydropower project to remain on schedule. Installation of the conduit liner will begin on 1 December 1987 with 50 cfs to be pumped over the dam to sustain downstream needs.

Abiquiu was operated under a deviation for the period 4 October 1986 to 22 January 1987 while unstable material from the downstream left abutment was removed. Approximately 440,000 cubic yards of material was removed while the release was restricted to an 8-foot diameter buried conduit with a 500 cfs capacity. Numerous small deviations assisted in bank stabilization efforts, sediment sampling, and inspections for the hydropower design.

Cochiti Lake began storing floodwater on 27 February and reached a record pool elevation of 5,434.50 (396,167 ac-ft) on 23 June. Once again in 1987 Cochiti was regulated to maintain a 50,000 ac-ft flood buffer in Elephant Butte Reservoir. On 10 July the Rio Grande Compact approved a waiver on the requirement to carry over 1987 flood water in Cochiti Lake through the summer. Release of this water continued until 7 August when the waiver was rescinded. From 7 August to present, Cochiti has been storing flood water released from Abiquiu. Some of this water will be released throughout the winter with the majority being released in February and March 1988. Numerous small deviations, which ranged from channel work to bridge construction occurred throughout the year.

No excess releases have been made in the Rio Grande below Caballo Dam since 29 July with none scheduled until 1 February 1988. During this period the IBWC will remove approximately 1,000,000 cubic yards of material in rebuilding the river channel, mostly in the Fort Quitman area.

In the Canadian River Basin, Conchas Reservoir experienced the largest snowmelt runoff since 1942. The inflow was sufficient to fill the project's conservation space and overtop the uncontrolled service spillway. The project began spilling on 15 February which was the first such spill since 1965. Flood releases down the usually dry Canadian River also filled and spilled the recently raised Ute Dam. Ute Dam and Reservoir is a state owned project located just above the NM-TX stateline. The maximum pool elevation at Conchas in FY 1987 was 4,201.52 (335,195 ac-ft).

In the Arkansas River Basin, John Martin Reservoir set a new record pool elevation of 3,856.80 (416,861 ac-ft) on 31 May 1987. A large irrigation pool was retained from the 1986 irrigation season and this coupled with above normal snowmelt runoff in the Basin produced the high pool. The downstream channel had not carried sustained flows since the mid-sixties. The growth of phreatophytes and channel aggradation presently restrict the channel capacity below John Martin Dam to about 3,000 cfs. This year was the first year, since the mid-sixties, that the Arkansas River was a free running river through the entire length of Kansas. There were numerous complaints of agricultural damages from the sustained releases from John Martin, most of which were the result of channel encroachment over the years. There were two deviations during this period; one for repairs on a diversion structure, and the second was for re-routing a power line which was jeopardized by bank erosion.

Trinidad Lake on the Purgatoire River came within .10 foot of setting a record pool in 1987. This was still within the range of the conservation pool. The maximum pool elevation was 6,222.54 (61,668 ac-ft) on 20 June.

Pueblo Reservoir is a Section 7, Bureau of Reclamation project, which was used to regulate flows on the Arkansas River below Pueblo, Colorado. The project regulation was considerably complicated in FY 1987 by the failure of Cucharas Dam on the Huerfano River. This structure, although never collapsing, did structurally fail as a result of piping and internal erosion and settlement. Evacuation of this impoundment also added to the inflow to John Martin Reservoir. Releases from Pueblo Dam were restricted to 5,000 during most of the evacuation period. The maximum pool elevation was 4881.88 (271,056 ac-ft) on 6 February 1987.

Flood control regulations in the Pecos River Basin in FY 1987 consisted of regulating flows to non-damaging rates at the Brantley Dam site. Brantley Dam is presently under construction and a temporary river crossing at the site restricts channel capacity to about 600 cfs. This restrains the maximum release from the nearest upstream reservoir (McMillan to 500 cfs).

Santa Rosa Lake and to some extent Sumner Lake in the upper basin were used to provide the regulation needed at Brantley. Storage in Santa Rosa Lake was used to maintain Sumner and McMillan essentially full while the McMillan discharge was held to 500 cfs. As a result of this operation, Santa Rosa Lake reached a record pool elevation of 4,749.75 (120,647 ac-ft) on 8 May. Sumner Lake was also used when intervening flows necessitated additional regulation below Santa Rosa Dam. Releases from Santa Rosa Lake were curtailed on two occasions to permit maintenance on a diversion structure at Puento de Luna.

The Albuquerque District hosted a meeting with the SCS, NWS, IBWC, USBR, and the states of CO, NM and TX in Alamosa, CO, this last August. The purpose of the meeting was to discuss ways of improving the snowmelt runoff forecasting in the Rio Grande Basin. The meeting proved to be very beneficial in bringing attention to a long-standing problem. Federal and state water management representatives brought out the importance of an accurate forecast in the Basin. The responsible Federal forecasting agencies (SCS/NWS) committed themselves to working closer with the users and providing a better product. A one-week workshop in November at the SCS's Portland, OR, facility will enable local input in forecasting procedures. Another result of the meeting is to meet in early March of each year to discuss the forecast for the upcoming year.

b. FORT WORTH DISTRICT. Fiscal Year 1987 was a very busy year for reservoir regulation activities in the Fort Worth District. Twenty flood control projects out of twenty-four projects used part of their flood control storage at least once during the year. Four lakes (Canyon, Stillhouse Hollow, Aquilla, and Somerville Lakes) established new record lake levels. In May and June 1987 a frontal system entered and stalled over central Texas for an extended period and caused wide spread flooding over three river basins. During the year 28 deviations from approved Plans of Regulations were approved to facilitate the effective operation of the District lakes.

The Guadalupe River basin experienced the most severe flooding of the three basins during the May-June flood event. The cities of Cuero and Victoria, Texas, were severely affected as much of the area was inundated for an extended time. The situation on the Guadalupe River was aggravated by concurrent flooding on the San Marcos River which enters the Guadalupe River at approximately 130 miles downstream of Canyon Dam and by flooding on the San Antonio River which enters the Guadalupe River downstream of Victoria, Texas. Canyon Dam received in excess of 14 inches of rain in a three week period during the May-June event. In June 1987 Canyon Dam reached an elevation of 942.67 feet n.g.v.d. or 0.33 feet below the top of the emergency spillway crest. During most of June 1987 a 24-hour operation utilizing three shifts was required to monitor lake level conditions. Periodic inspections of the embankment were conducted to observe structural damages, slides or sloughs, new seepage areas, movement of riprap areas, and downstream sand boils. There was speculation that Canyon Dam might experience significant leakage because of numerous springs in the area, however, no problems were encountered and the dam functioned successfully. During the May-June event Canyon Dam prevented approximately $3.8 million in damages.

The Brazos River Basin experienced intermediate flooding from December 1986 through July 1987 with the most severe flooding occurring during May and June 1987. Many complaints were received from landowners along the Little, Leon, Lampasas, and

San Gabriel Rivers during periods of high flows. District personnel completed an aerial video of the river during the June 1987 high flows to correlate with areas of landowner concerns. The video tape was made available for viewing by landowners and other District elements and showed that the major problem was bank erosion. Landowners were in agreement that the phenomena was naturally occurring and not caused by the Corps regulation. The nine Corps of Engineers lakes in the basin prevented approximately $1.4 million of damages in December 1986 and an additional $15.0 million of damages during May through June 1987. In June 1987 three lakes set new record lake levels as Aquilla Lake reached 545.51, Stillhouse Hollow reached 639.55, and Somerville Lake reached 250.74 feet n.g.v.d., respectively.

The Trinity River basin experienced flooding from February through July 1987 with the February-March and May-June periods being the wettest. Of the eight Corps lakes in the basin only Joe Pool and Ray Roberts did not enter into the flood control pool during FY 1987. The lake projects prevented approximately $14.7 million and $54.1 million in damages during these two flood periods, respectively.

On 30 June 1987 deliberate impoundment began at Ray Roberts Lake. By the end of the fiscal year the lake had risen to elevation 571.33 feet n.g.v.d. or 2 percent of conservation pool. The Cities of Dallas, and Denton have contracted for the use of the Ray Roberts water supply storage and have permits from the State of Texas to appropriate water from the lake. To date the water supply storage, 74 percent owned by the City of Dallas and 26 percent owned by the City of Denton, has not been activated for water supply releases.

On 5 March 1987 construction was initiated on non-Federal hydropower facilities at Town Bluff Dam. The facilities are being financed by the Sam Rayburn Municipal Power Agency and are scheduled for completion at the end of June 1989.

On 9 September 1987 releases were intiated at Canyon Dam to draw the lake level down to elevation 901.00 feet n.g.v.d. to facilitate the construction of non-Federal hydropwer facilities. These facilities will be constructed and paid for by the Guadalupe Blanco River Authority. The gates at Canyon Dam will be closed on 14 November 1987 so that the flood control conduit can be relined with a steel liner. The work in the conduit and stilling basin will necessitate that the gates remain closed until 2 March 1988. An Operating Agreement has been signed with GBRA which allows for two release periods during construction in the event flood waters need to be evacuated. During closure, water will be diverted downstream at a rate of up to 75 cfs to meet downstream needs.

In May 1987 the Fort Worth District conducted Exercise Spring Rain to test the effectiveness of the Lake Control personnel. The excercise was on an abbreviated frame with activities

condensed so that Lake Control personnel would purposely be strained during a normal two day period. The Lake Control personnel performed their tasks effectively but the exercise showed that in a real-time flood with 24-hour operation and over an extended time the current five experienced regulation personnel would become over taxed. Cross training of other Hydrology and Hydraulics Branch personnel to Lake Control methods of operation has never completely materialized and the effectiveness of these support personnel in a real-time flood is yet untested. Recommendations to restructure the Reservoir Control Section are in progress to increase full-time regulators by approximately 80 percent.

c. GALVESTON DISTRICT. There were no special reservoir operations during FY 1987.

d. LITTLE ROCK DISTRICT. With one notable exception, FY 1987 will go on record as a relatively dry year in the Little Rock District. That exception, of course, is the Arkansas River rise of early October. This rise originated almost entirely in the basins west of the District, with very little contributing runoff from the intervening area downstream of Van Buren. As was the case last year, the summer was characterized by low river states throughout the District and correspondingly low lake inflows. As the year came to a close attention was focused on maintaining navigation in the White River Entrance Channel area. Continuing low flows on both the White and Mississippi Rivers caused width restrictions and some delays in that area.

(1) Special operations and activities related to water control projects are summarized as follows:

(a) Little River System.

(1) Tests to locate the source of the vibration problem in the gate towner at Gillham Lake, scheduled for FY 1987, were not conducted because the pool elevations at which vibration occurred were not experienced during the water year. Significant vibration has been experienced to begin at elevation 540.0 msl. Funds have been set aside in FY 1988 to conduct the tests should the proper conditions occur. An early warning vibration detection system was installed at the Gillham gate tower in October, 1986. General maintenance to the Gillham gate tower was completed in FY 1987 including repairs to the low flow butterfly-valve, number 2 emergency gate, number 1 service gate, and gate stems.

(2) The Arkansas Game and Fish Commission drawdown at Dierks Lake was completed and the pool refilled in March 1987. An additional drawdown to elevation 517.0 msl was required to allow for the construction of a boat ramp and related facilities not completed during the FY 1986-1987

drawdown. The drawdown was cancelled after completion of the boat ramp in April 1987, however, the pool as of October 1987 had not recovered due to inadequate inflows.

(3) A drawdown to elevation 426.0 msl at DeQueen Lake to facilitate fishery management by the Arkansas Game and Fish Commission was approved and begun in March 1987. It will continue through March 1988.

(4) A drawdown to elevation 256.2 msl at Millwood Lake, also to facilitate fishery management by the Arkansas Game and Fish Commission, was approved and begun in March 1987. It will continue through March 1988. During FY 87 Millwood Lake experienced approximately six rises while the Tri-Lakes projects experienced seven to nine rises.

(5) There were seven system deviations on the Little River System in FY 1987 including fishery drawdowns, canoe releases and gate repairs.

(b) Arkansas River System

(1) The year started with its most significant event on the Arkansas River. During the period 29 September to 3 October consistently heavy rains fell on the Oklahoma and Kansas portions of the basin. By 1 October the river rose above flood stage at Van Buren and crested on 9 October with a flow of approximately 350,000 cfs. This event was unique in the Little Rock District in that there was no significant intervening inflow downstream of Van Buren. The two flood control projects within the District in the basin remained near their conservation levels throughout the event. The flood crest on the Arkansas, was, therefore, modified as it traveled through the District. The post flood analysis did not reveal a need to change the water control practice of any District projects.

(2) During the year there were two additional rises. The next was on 19 February, bringing the flow to approximately 94,000 cfs. One on 18 March went up to 130,000 cfs, and one on 31 May rose to 166,000 cfs. The annual recorded flow at Lock and Dam 13 for FY 1987 was 51,190,000 acre feet. Of the fifteen deviations to the water control plan originated in the Little Rock District, nine were to raise pools to improve navigation conditions. The other significant deviation on the navigation system was to raise Pool 5 during the summer months for the continuation of a ground water study which was begun last year and conducted by the USGS. A deviation was used in June to delay the release of stored flood water at Nimrod until the Arkansas River receded in an effort to lessen the impact of backwater flooding. At Blue Mountain the Arkansas Game and Fish Commission requested the Corps to deviate from the plan of regulation in order that the transition to seasonal pool could be

delayed. The purpose was to evaluate their fisheries management program and to allow construction of an access ramp and parking area. This deviation will be repeated in FY 1988.

(3) Flow measurement for real time data collections was improved at Trimble Lock and Dam this year with the implementation of DCP transmitted gate sensor data. The sensors, installed by the USGS, accurately measure the gate openings on a real time basis allowing more accurate computation of actual releases during flow ranges from 0 to 133,000 cfs (open river). A tailwater elevations above 388.3 msl the gates are lifted out of the water and the system is inoperable.

(c) White River System

(1) During FY 1987 the White River System experienced four rises occurring in October of 1986 and February, March, and April of 1987. During FY 1987 the highest pool rises experienced at Beaver and Table Rock occurred from the October event producing pool rises of 4.2 and 5.6 feet respectively. At Bull Shoals and Norfork the February event produced the highest pool rise in FY 1987 of 5.0 and 2.4 respectively. At Greers Ferry the March event produced the highest pool rise during FY 1987 of 2.9 feet and at Clearwater the April event produced the highest pool rise in FY 1987 of 7.6 feet.

(2) Due to the low inflows experienced in the latter half of FY 1987 Beaver, Table Rock, and Bull Shoals have been below the top of their power pools since late April - early May. Greers Ferry has been in its power pool since late March and Norfork has been in its power pool since early August.

(3) There were eleven deviations on the White River system during FY 1987. Two were for Table Rock, one for Table Rock and Bull Shoals, one for Greers Ferry and seven for Clearwater. The two at Table Rock were to extend the weekly allowable power drawdown an additional 0.5 feet and to restrict releases to aid in the installation of an operable gate in the flashboards of Powersite Dam. The Table Rock - Bull Shoals deviation reduced required releases while in the buffer zone. Greers Ferry's deviation was to curtail releases for a Media Appreciation Day. Of the deviations at Clearwater, two were to reduce downstream stages to facilitate work on a water intake structure and to aid in a bridge repair. Other deviations were to set controlled releases for the Black River Challenge raft race, and to assist a USGS seepage study. One deviation allowed a smooth transition to seasonal pool to help the fish spawn.

(2) Studies, reports, and investigations related to water control projects are summarized as follows:

(a) Beaver Dam Safety Assurance Reconnaissance Report. The report published in 1984 recommended study of the

seepage beneath Dike 1 which has existed since the intitial pool filling operation in 1966. During December of 1984 Beaver reached its pool of record. At that time increased seepage appeared, some of which was discolored. This prompted investigation and a Supplement 1 to the Reconnaissance Report was completed in April of 1986 recommending a cutoff wall be constructed through Dike 1. At this same time a deviation was obtained to establish the top of the flood pool at elevation 1128.0 msl in lieu of 1130.0 msl with the stipulation that water not be held above 1125.0 msl in excess of four days. A design memorandum was completed in September 1987 and comments are being addressed. Automated piezometers have been installed. A Request for Technical Proposal will be issued to prospective bidders in the spring of FY 1988. LRD plans to be able to award a construction contract in the beginning of FY 1989. Beaver Dam has been rated the highest priority dam safety problem in SWD.

(b) White River Lakes Regulation Study. The latter part of FY 1986 and first quarter of FY 1987 were spent calibrating and refining the Southwestern Division's SUPER compurter model. Production runs were resumed in January 1987. Several schemes of operation with regard to release patterns and regulating stages have been investigated with a basic candidate plan chosen to date. This plan consists of a balanced lake operation for the four upstream projects and new regulating stages at three control points. Selection of this plan was made with respect to flood control operations, hydropower production, recreation and total flood damages. Further studies are planned during FY 1988 to refine the candidate plan.

(c) Table Rock Dissolved Oxygen Study. The modeling portion of the study was initiated with the Waterways Experiment Station (WES) in July 1986. WES provided a time and cost estimate in October 1986. This estimate consisted of a two phased plan of study which would cost about $850,000 and take 3 1/2 to 5 years to complete. This proposal has been modified to a three phased plan of study to cost about $700,000 and take 4 years to complete. Phase I of the model study is scheduled to be completed in the first quarter of FY 1988. FY 1987 funds to WES were $165,000. LRD has budgeted $300,000 to continue work in FY 1988.

(d) Clearwater Lake Spillway Adequacy Study. The study in 1978 found that the spillway at Clearwater was inadequate to pass the maximum probable flood as it was defined at that time. Subsequent to that study a comprehensive analysis of the seepage through the left abutment was completed in 1981. In may 1986 a revised Reconnaissance Report was submitted to SWD and forwarded to HQUSACE. The report recommended that the seepage be corrected using material excavated from the spillway area, thereby enlarging the spillway at the same time. Also recommended was the addition of a parapet wall along the crest of the dam. The seepage correction and the parapet wall were approved, but not the enlargement of the spillway beyond the

seepage excavation requirement. The notice to proceed has been issued. A pre-construction conference is scheduled for 30 October. Construction should start in early November.

(e) Norfork Units 3 and 4. The feasibility report for these units has been delayed. Six alternatives were considered during the study. The alternatives include the addition of pumpback and additional units.

(f) White River Basin Comprehensive Report. The reconnaissance report was finalized and no cost-sharing sponsors have been found.

(g) Arkansas River Basin Study. The study is a general investigation study. The cost-sharing agreement with the non-federal sponsors was completed in July 1987. The navigation portion of the study will address the possible need for reallocation or additional system storage to reduce the magnitude and duration of flows which hamper navigation. The non-navigation feasibility studies will address the need for water supply, flood control, recreation and fish and wildlife in the Oklahoma and Arkansas area. An "Operational Plan Review Status Report" is scheduled for March 1988 and will address three operating plans. The feasibility report is scheduled for completion in July 1990.

(h) Arkansas River Land Impact Study. The study was initiated as a result of numerous complaints concerning the frequency and duration of flooding along the main stem of the Arkansas River. The study objective is to identify any lands where additional real estate acquisitions are required. The results of these investigations will be reported in the form of a supplement to the Real Estate Design Memorandum for each pool where additional real estate actioins are required. If, for a given pool, no real estate action is required, data supporting this finding will be forwarded for review in the form of a Hydrologic & Hydraulic Report. The study began in March 1986 and is scheduled to be completed in March 1988. A study of the major tributaries to the Arkansas River is planned upon completion of the main stem study.

(i) Non-Federal Hydropower Development. The Little Rock District (LRD) is responsible for reviewing preliminary permits and applications filed with the Federal Energy Regulatory Commission (FERC) for the development of hydroelectric power at Corps projects or non-Corps projects within LRD boundaries to ascertain potential impact on Corps responsibilities. At Corps projects, licenses for non-Federal hydropower development have been issued and construction is approximately 70 percent complete at James W. Trimble Lock & Dam (No. 13) and Murray Lock & Dam (No. 7) on the Arkansas River. Licenses have also been issued at Arthur V. Ormond Lock & Dam (No. 9), Lock & Dam No. 3, Wilbur D. Mills Dam (No. 2), on the Arkansas River, and at Nimrod, Millwood, and Gillham Lake

projects. However, licensees are not pursuing development at the Millwood and Gillham projects.

Also at Corps projects, license applications are being reviewed for development at Locks and Dams 4, 5, 6, and Toad Suck Ferry Lock and Dam, on the Arkansas River, and at the DeQueen and Dierks Lake projects. Preliminary permit applications have been reviewed for potential non-Federal hydropower development at Clearwater Dam (MO) and at the Greers Ferry (AR), Norfork (AR), and Table Rock (MO) projects utilizing the conduits which supply water from the dams to the fish hatcheries.

At non-Corps sites, the District has reviewed FERC applications for hydropower development at three dams on the White River near Batesville, Dam 3 on the Spring River, and Lee Creek near Fort Smith, Arkansas. A decision is pending on the city of Fort Smith's FERC application and the Corps' application for a Section 404, Clean Water Act, permit to construct a dam for public water supply and hydroelectric power generation on Lee Creek.

(3) Other significant items relating to water management activities are as follows:

(a) Water Control Data System (WCDS). Reservoir Control personnel are utilizing applications software developed by LRD to enter all daily reservoir data, perform water budget computations, and prepare daily reports and forecasts. The Data Collection Platform (DCP) data are currently being retrieved from the National Environmental Satellite, Data, and Information Service (NESDIS) downlink. DCP data are being stored in the Data Storage System (DSS), a data base developed by the Hydrologic Engineering Center (HEC). Modifications were made to the system this year to more fully utilize DCP data and, thereby, minimize the project reporting requirements for daily reservoir data. Additional software was developed to use DCP data directly from DSS in generating daily reports. The TOTAL data base was also installed on the system this year and data is currently being stored in both TOTAL and DSS. Applications programs from HEC and modifications of those programs allow users to view, edit, and plot the data, and to generate reports from the data.

(b) DCP Status. LRD has 36 DCP's in the Arkansas River Basin, 13 DCP's in the Little River Basin and 42 DCP's in the White River Basin for a total of 91 operating DCP's. LRD is currently monitoring 10 DCP stations outside the District. Memphis District will install DCP stations at St. Charles and Des Arc on the White River in FY 1988. When activated, LRD will begin secondary usage of these stations. LRD is planning to reprogram 21 DCP's to fill time slots on the GOES western satellite being vacated by the Fort Worth, Galveston and Tulsa Districts.

(c) Automation of Field Operations and Services (AFOS). LRD is currently receiving AFOS system data from the National Weather Service (NWS) Tulsa River Forecast Center through a line providing data to the Tulsa District and SWD. Selected products are routed to the Total data base and to a printer, while others can be viewed with the VUENWS program.

e. TULSA DISTRICT.

(1) ARKANSAS RIVER BASIN. Flows in the Arkansas River Basin during FY 1987 were about 230% of normal with the most significant departure from normal occurring as a result of the flood of October 1986. Flows from this flood accounted for about one-third of the total annual basin flow.

The October 1986 flood resulted from a period of heavy rainfall which occurred between 29 September and 4 October 1986 over much of northeastern Oklahoma and southeastern Kansas. The storm system was caused by the combination of a low pressure system over southwestern United States picking up remnants of Hurricane Paine off the western coast of Mexico, a high pressure system over southeastern United States preventing movement of the storm and a jet stream across Oklahoma from southwest to northeast. The result of this storm was rainfall amounts in excess of 20 inches over sections of northeast Oklahoma and southeast Kansas.

Record high stages were observed at seven stream gaging sites in the Arkansas River basin. These locations were on the Arkansas River at Tulsa, the Caney River at Bartlesville, the Cimarron River at Perkins, the Chikaskia River at Blackwell, the Illinois River at Eldon, the Canadian River at Watonga, and the North Canadian River at Harrah. Record high stages would have also occurred at nine other gaging locations along the Arkansas, Verdigris, Caney and Fall Rivers and Bird Creek if flows had not been regulated.

Fifteen projects reached record high pool elevations during October 1986. These projects included Kaw, Keystone, Hulah, Copan, Oologah, Birch, Skiatook, Elk City, Toronto, Pearson-Skubits Big Hill, Fort Gibson, Hudson, Chouteau, Webbers Falls and W. D. Mayo. Pensacola, Tenkiller, El Dorado and Fall River Lakes all reached their second highest pool of record during this period while John Redmond reached its third highest pool. During this flood, eleven lakes in the Arkansas River system completely filled or exceeded their flood control capacity. These projects include Kaw, Keystone, Hulah, Copan, Oologah, Pearson-Skubitz Big Hill, Elk City, Toronto, Fort Gibson, Pensacola, and Hudson with Hulah exceeding the top of surcharge pool. The October 1986 flood control operation and flood information are described in the Water Management Analysis Report, Flood of September-October 1986, dated August 1987.

Taper operations were in effect from 1 October until late July with the exception of a three week period in May. The maximum high pool was set at Arcadia Lake in FY 1987 and a third high pool was set at Cheney Lake. Both of these events were unrelated to the October 1986 Flood.

Special releases were made from Copan in July and Fort Gibson and Eufaula in August and September to alleviate fish kill problems in the stilling basins. Releases were shut off at Elk City for short periods of time during November and December to allow for temporary repairs to the damaged outlet channel caused by the October flood. Annual raft races for various organization required releases from Council Grove, El Dorado, Robert S. Kerr, W. D. Mayo, Keystone and Fort Gibson Dams.

(2) RED RIVER BASIN. Flows in the Red River basin during FY 1987 were significantly above normal for the upper basin above Lake Texoma and significantly below normal for the lower basin below Lake Texoma. Inflows into Altus Reservoir necessitated nearly continuous releases from late October through late April. Record pool levels were set at Fort Cobb, Lake Kemp and Tom Steed Reservoirs as a result of the October 1986 flood described in paragraph a, above. A significant high pool elevation was also reached during October at Waurika Lake.

During May 1987 heavy rainfall and flooding was again experienced over the upper Red River basin above Lake Texoma with an average of over 5 inches of rainfall during a nine day period. Heaviest rainfall occurred in Duncan, Oklahoma with an accumulated total of over 14 inches. Hobart, Marlow and Paul's Valley, Oklahoma experienced over 12 inches of rainfall for the period. Maximum flows of record were observed on the Red River at Gainesville, Texas and on the Washita River at Dickson, Oklahoma. Inflows into Lake Texoma during this period exceeded 300,000 cubic feet per second resulting in the second highest pool of record at Lake Texoma. Record high pool elevations were set for a second time as a result of the May-June flood at Fort Cobb, Lake Kemp and Tom Steed Reservoirs exceeding the record high pools set in October 1986. Record high pool elevations at Foss Reservoir and Waurika Lake and significant high pools at Altus and Arbuckle Reservoirs were also attained during the May-June flood. Impoundment of final storage was begun at McGee Creek Lake on 2 April 1987. The conservation storage had not completely filled by the end of September 1987.

Special releases were made from Denison Dam-Lake Texoma from mid-August through September to alleviate a fish kill problem in the stilling basin.

3. WATER QUALITY PROGRAM AND ACTIVITIES

a. ALBUQUERQUE DISTRICT. The goals of the Albuquerque District water quality data collection program are to provide an accurate picture of lake conditions as to pH, turbidity,

temperature, and dissolved oxygen. Trends are monitored to show improvement or degradation of water quality and the data used to identify public health, fish and wildlife problems.

Readings are made on a monthly basis for the following parameters: surface pH, conductivity secchi disk, and dissolved oxygen and temperature at surface and one-meter increments to the bottom.

This data is available in the District Operations Office. The following is a listing of sampling locations for each project:

WATER QUALITY SAMPLING LOCATIONS

PROJECT	LOCATIONS	NUMBER
Abiquiu	Chama inflow, Canones inflow, reservoir near dam, release	4
Cochiti	Bland canyon, reservoir near dam, release	
Conchas	Conchas and Canadian inflow, reservoir near dam, irrigation headworks	4
John Martin	Arkansas inflow, reservoir near boat ramp, reservoir near dam, reservoir near Ft. Lyon Hospital, two Lake Hasty locations, release	7
Trinidad	Purgatoire inflow, reservoir near dam, reservoir near Carpios ridge	4
Jemez Canyon	lnflow, reservoir near dam	4
Santa Rosa	Pecos inflow, reservoir near dam, reservoir near asphalt pit, release	4

Biololical samples are tested monthly at all projects. District personnel are trained in the use of a gas chromatograph to test for dissolved nitrogen.

b. FORT WORTH DISTRICT.

(1) For FY 1987, a water quality report for Wright Patman Lake was completed and submitted to SWD for review and approval. Of the 24 total Projects in the Fort Worth District, water quality reports for 14 projects have been completed and submitted to-date. Water quality reports for Waco, Whitney, Bardwell, Belton, and Wright Patman Lakes are still Pending approval by SWD. No major water quality problems of any significance have been found in any of these projects.

(2) A destratification system consisting of a 150 scfm compressor and two 100 feet diffusion lines, placed 2000 feet

apart, was installed at Grapevine Lake by the City of Grapevine in April 1987. The purpose of this system is to prevent entry of soluble iron and manganese into the lake waters. The effectiveness of the system has not yet been determined as it was activated in May 1987 when the stratification of the lake had already taken place.

(3) Water quality surveillance at SWF for FY 1988 is $212,350 compared to $225,750 for FY 1987. The FY 1988 program includes water quality sampling at Joe Pool, Lewisville, Aguilla. Stillhouse Hollow, Georgetown, Granger and Somerville Lakes.

GALVESTON DISTRICT. There were no Water Quality Activities during FY 1987. However, a draft report for the three year quality program to show the effects of the length of impoundment on the quality of water for Addicks and Barker Reservoirs has been revised by U. S. Geological Survey.

d. LITTLE ROCK DISTRICT. The District water quality management programs are divided among various elements of the Construction-Operations Division and Engineering Division by functional missions.

(1) Construction-Operations Division Responsibilities. The Permits Branch has responsibility for conducting the District water quality Program for Construction-Operations Division. Since the regulatory functions of the branch under the Section 10/404 permit program closely parallel functions of the Division's water quality management program, field activities are very conveniently and efficiently combined to implement the programs. These responsibilities include the following programs relating to water quality management.

(a) Reservoir Monitoring. General reservoir water quality monitoring of all Little Rock District reservoirs other than the main stem of the Arkansas River is presently performed three times per year at six to eight stations at various depths. The fieldwork is done by USGS personnel under Corps of Engineers Interagency Agreement. Approximately 26 parameters are measured to ascertain general reservoir water quality and to provide background data in detecting water pollution. There are no State or other Federal programs which routinely provide these data on the reservoirs operated by the Corps. Data obtained are maintained in the Permits Branch and are stored in and available from STORET, WATSTORE, and annual USGS Water Resources Data Publications for Arkansas and Missouri. Data obtained are used to evaluate basic water quality and long and short term water quality changes, to identify pollution sources, and to properly manage reservoir water quality. Their evaluations include the identification of potential pollution sources so as to enable the Corps to have meaningful input in the decision making processes of other agencies and groups with regulatory authority over basin

discharges. These findings are published in Water Quality Management Reports and annual updates for each project. The Greers Ferry and Table Rock Water Quality Management Reports have been published and the Blue Mountain report is in progress. A statistical analysis has been performed on data collection thus far (1974-present) and has proved to be very valuable. Bottom sediment samples were collected from eight LRD reservoirs in 1984 and have been analyzed for organics, nutrients, and metals. This program is conducted pursuant to ER 1130-2-334.

(b) Discharge permit and Operational Monitoring. Monitoring of the 34 Corps-operated wastewater treatment systems in the District is performed in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements. The USGS obtains the necessary monthly samples and analyzes these for Biochemical Oxygen Demand (BOD), bacteria, and suspended solids. Operational monitoring performed twice weekly by the sewage treatment plant operators includes in some cases pH, flow, chlorine residual, dissolved oxygen, and settleability. Operational changes are recommended as necessary. Data are formatted and computer stored in the Permits Branch. This program is conducted in accordance with Section 402 of the Clean Water Act which requires reporting to the Department of Natural Resources in Missouri and the Department of Pollution Control and Ecology in Arkansas.

(c) Bathing Beach Monitoring. Monitoring is performed five times monthly by resident area personnel on District bathing beaches during the swimming season to insure safe bacterial quality of reservoir waters. Samples are analyzed by the Missouri and Arkansas Health Departments free of charge. A central log containing results for all projects is maintained by the Permits and Water Quality Section. This program is administered in accordance with SWD regulation 1130-2-9 and applicable State laws.

(d) Potable Water Monitoring. Potable water supplies of the District are tested for physical, chemical, and bacterial quality. Samples are collected by resident area personnel and mailed to the appropriate health departments, which perform the analyses free of charge. When tests indicate a bacterial problem, corrective measures are immediately taken. In some cases chronic problems detected by this sampling causes wells to be replaced or reworked. Permits Branch personnel collect samples for complete chemical analysis by the health departments on each new water supply and for periodic nitrate analysis thereafter. Data obtained are used in the periodic sanitary survey and report forwarded to SWD for reporting to HQUSACE. This program is conducted in accordance with ER 1130-2-407 and applicable Federal and State drinking water standards for non-community water supply systems.

(e) Dredged Material Analysis. Periodically, a bottom sediment survey is performed at twelve locations along the Arkansas River navigation project and less frequently at other locations on other District rivers and reservoirs. Sediment and water column samples are frozen and sent to SWD laboratory for sediment, water, and elutriate analyses. The purpose of this program is to detect potential effects of dredging operations on water quality, and to have these data available for the required 404(b)(1) evaluations of future Corps and private dredging. These operations include both commercial dredging under Corps permits and channel maintenance dredging performed under Corps of Engineers contract.

(f) Pollution Complaints and Hazardous Substances. Permits Branch and Resident Offices receive calls reporting instances of pollution and hazardous substance spills. These reports are coordinated sith the appropriate Federal and State officials. On occasion, Corps personnel investigate these pollution complaints to verify existing conditions and determine effects on project operations. During oil and other hazardous substance spills, Corps personnel participate in notification and other emergency measures with Coast Guard and EPA officials and when so designated, act as the Federal on-scene coordinator for these two agencies under the National Contingency Plan. The LRD Oil and Hazardous Substances Pollution-Contingency and Spill Prevention, Containment and Countermeasure Plan was rewritten and updated as of August 1983. LRD personnel participated with other State and local agencies in a Natural Disaster exercise in September 1985, which included a successful test of this plan.

(g) Special Activities. Permits Branch periodically assists Engineering Division and Planning Division in obtaining samples and analyses for special water quality and planning studies conducted by them. Coordination is also accomplished on studies being performed by other agencies such as the EPA, Health Department, Soil Conservation Service, etc. Cooperative water quality studies are periodically conducted with other agencies in monitoring activities authorized under Corps Section 10 and 404 permits. Permits Branch personnel are also involved on a daily basis with personnel of Arkansas Department of Pollution Control and Ecology in the processing of Corps permits and resolving the water quality matters arising therein.

(2) Laboratory Capabilities. Water quality analysis performed at the District level are limited to the following capabilities.

(a) Field testing of water quality which may be conducted by the Corps personnel includes dissolved oxygen, temperature, pH, specific conductivity, Secci Disc measurements, and other using HACH field test kits approved by EPA.

(b) A small laboratory located in Construction-Operations Division can perform the following analyses: dissolved oxygen, color, turbidity, alkalinity, hardness, and others using colorimetric methods of analyses.

(3) Data Management. Reservoir water quality data collected and analyzed by USGS are entered into WATSTORE and STORET, the computerized data management systems of the USGS and EPA, respectively. These data are also published in the annual USGS water resources reports for Arkansas and Missouri. Results of potable water, bathing beaches, NPDES, and other monitoring are kept in computer storage, log books, or files as appropriate. Special data collection results are contained in the reports dealing with the specific subject for which data were collected.

(4) Engineering Division Responsibilities. There is no specific organization for water quality studies within the Engineering Division. Responsibility is assigned to the various elements based on the nature of the program study.

(a) Reservoir Profile and Release Monitoring. Water quality data have been collected at Beaver, Table Rock, Bull Shoals, Norfork, and Greers Ferry Lakes since 1966; at Blue Mountain, Clearwater, and Nimrod Lakes since FY 1981; and at DeQueen, Dierks, Gillhanm and Millwood Lakes since April 1981. Presently, monthly profiles of pH, temperature, dissolved oxygen, and specific conductance are obtained from the 12 reservoirs, as well as a gravel sample below each dam. Additional profiles are obtained from Table Rock Lake during critical times of the year. These data are used in the design of the operating features needed for preventing or lessening water quality problems downstream of the dams. They also contribute to the water control management of releases from Table Rock and to maintain acceptable temperatures downstream of all reservoir projects from May through October. The Hydraulics Branch is responsible for this program and data collection is contracted to USGS.

(b) Special Studies. The Hydraulics Branch in conjunction with the Planning Division, periodically conduct water quality studies as part of normal project planning efforts such as preparation of survey reports, design memoandums, and environmental impact statements.

(c) Taylor Bay Siltation Study. This study investigated the effects of suspended sediment on fishing in Taylor Bay near Augusta, Arkansas. Nine measures have been identified for consideration as solutions. The technical studies have been completed and the report is scheduled for completion following a ruling on the suit filed in Federal District Court.

e. TULSA DISTRICT. Environmental Resources Branch performed three major water quality studies during FY 1987.

(1) Lake Texoma Net Pen Aquaculture Demonstration Project. Environmental Resources Branch conducted an intensive study aimed at determining the effects of net pen aquaculture of 250,000 channel catfish on water quality in the Rock Creek arm of Lake Texoma. Data collection began in May following the introduction of fish into floating net pens and continued beweekly throughout the remainder of the fiscal year. Sampling activities included extensive field measurements and the collection and laboratory analysis of water and sediment samples. This study will continue for an additional two years and will ultimately result in the development of a computer model capable of predicting water quality based on varying conditions of facility design, hydrodynamics, morphometry, and existing water quality. This will provide a future basis for optimizing the size, location, number, and operation of net pen facilities on specific Corps projects.

(2) Broken Bow Lake, Oklahoma. Increasing concern over deteriorating water quality conditions at Broken Bow Lake, Oklahoma prompted a water quality study conducted by the Environmental Resources Branch during the summer of 1987. Baseline water quality data were collected biweekly at five sampling sites on the lake. Field measurements of dissolved oxygen, pH, water temperature, and conductivity were recorded on each date. Water samples were also collected and returned to the laboratory for analysis of nutrients, turbidity, algal pigments, and a number of other physicochemical water quality parmeters. These data will provide a basis for future investigations of the effects of increasing watershed disturbances on lake water quality.

(3) Proposed Mid-Ark Damsites Water Quality Studies. Water quality data were collected during the summer of 1987 in the project areas for the proposed Arlington, Cunningham, Norwich, and Wellington damsites in southern Kansas. Measurements of stream cross-sections, velocity, and substrate type were recorded. Dissolved oxygen readings were also recorded and samples collected for analysis of nutrients, biochemical oxygen demand, chlorophyll, hardness, chlorides, and other parameters. These data will be used in a modeling study aimed at predicting water quality for these proposed projects.

4. SEDIMENT ACTIVITIES.

a. ALBUQUERQUE DISTRICT. A new area-capacity table for Trinidad Lake has been completed (July 1987) and will be adopted 1 November 1987. New area-capacity tables for Cochiti and Conchas Reservoirs are scheduled to be completed in 1987 and adopted 1 January 1988. Initial or letter sedimentation survey reports for those projects are scheduled to be completed in 1988.

Due to the high spring runoff in 1987 on the Rio Grande a Reconnaissance Hydrographic Survey was done in July 1987 at Cochiti Lake to supplement and compare to the data collected in

the 1986 survey. Also, in July 1987 a hydrographic survey was done at Santa Rosa Reservoir. The data will be used to revise the area-capacity table.

b. FORT WORTH DISTRICT. Funds in the amount of $65,000 have been approved for a sedimentation resurvey at Stillhouse Hollow Lake in FY 1988. The resurvey is scheduled to begin in November 1987. Bardwell Lake sedimentation survey report, associated with the 1981 sedimentation resurvey, was completed and submitted to SWD for approval. Proctor sedimentation resurvey report associated with the 1986 resurvey, was submitted to SWD in October 1987.

c. GALVESTON DISTRICT. A sediment policy was established in 1985 by the District to provide guidance relative to settling basins or alternative control methods on inflowing streams to reduce velocity and essentially preclude the permanent deposition of sediment in the Federally-owned lands of Addicks and Barker Reservoirs. Survey sections on the Horspen and Langham diversion channel were completed in fiscal year 1986. Sediment staff gages have also been set in place. Dredging in connection with navigation is shown in the following table:

NAVIGATION PROJECTS - DREDGING
(Cubic Yards)

PROJECT	FY 1986	FY 1987 1/
Brazos Island Harbor	413,210	1,169,359
Corpus Christi Ship Channel	4,881,853	- - - - -
Freeport Harbor	925,709	1,241,905
Galveston Harbor	2,776,826	57,851
Houston Ship Channel	794,830	3,619,951
Matagorda Ship Channel	6,363,703	2,464,282
Sabine - Neches Waterway	9,950,494	1,530,795
Trinity River Channel	808,500	248,218
Texes City Channel	- - - -	948,267
Double Bayou	= = = =	331,227
SUBTOTAL	26,915,125	11,611,855
GIWW		
Sabine River to Galveston	353,326	- - - - -
Galveston to Corpus Christi	8,455,772	7,177,663
Corpus Christi to Mexican Border	2,106,939	1,747,443
SUBTOTAL	10,916,037	8,925,106
TOTAL	37,831,162	20,536,961

1/ Preliminary data subject to revision.

d. Little Rock District.

(1) Summary of Activities. Suspended sediment samples are collected at 16 stations. The 247 sediment ranges on the main stem of the Arkansas River are resurveyed as near annually as funds and survey workload permit. From October 1986 through September 1987, there were 143 ranges scheduled for resurveying; 100 resurveys were accomplished. There are 185 ranges scheduled to be resurveyed in FY 1988. Fifty-six tributary ranges are resurveyed less frequently when appreciable deposits are suspected. About 50 index ranges out of 350 sediment ranges in the other eight reservoirs are resurveyed at 10-year intervals. During the period from October 1986 through September 1987, none were resurveyed. Index ranges are scheduled to be resurveyed at five reservoirs during FY 1987.

(2) White River Entrance Channel Model. The Entrance Channel model is a physical, movable bed hydraulic model which has been constructed at Waterways Experiment Station (WES) to study the navigation depth problems which occur on the White River between its confluence with the Mississippi River and Lock and Dam 1. This reach of the White River serves as the entrance to the Arkansas River Navigation System. Design of the model began in November 1981 and construction was completed in September 1983. Adjustments and verification tests were completed in September 1983. Tests with additional contraction works were completed in August 1984. A sediment trap plan was tested, but did not provide an acceptable navigation channel. Tests diverting Arkansas River flow into the entrance channel have been completed. This improved the navigation channel but did not provide a reliable channel. The model continues to be tested with a lock at navigation mile 0.5. Studies are underway to determine the economic feasibility of a solution.

(3) Channel Maintenance. Maintenance dredging to maintain navigable depths amounted to approximately 4.0 million cubic yards in FY 1987. Approximately 3.6 million cubic yards were dredged on the Arkansas River and approximately 368,000 cubic yards on the White River Entrance Channel. Approximately 50% of the total amount dredged or 2.0 million cubic yards was required as a result of the high flows experienced in October. This was an overall increase of about 2.0 million cubic yards from the FY 1986 dredging requirements for the river system. Dredging was performed in Pools 2, 3, 4, 5, 7, 9, Lake Dardanelle, Ozark Lake and the White River Entrance Channel. Also, six shoals in the navigation channel were removed by the Corps-operated Arkansas River Fleet with three clam dredges operated by the Resident Offices. The Vicksburg District dustpan dredge, Jadwin, was used to remove two shals in Pool 2 that resulted in 862,000 cubic yards of dredged material. Locks Nos. 1 and 13 were closed for unwatering and inspection this year. Apprximately 11 groundings exceeding 1 hour each occurred on the navigation system in FY 1987.

e. TULSA DISTRICT. During FY 1987, limited reconnaissance resurveys were conducted at Keystone, Eufaula, and at Lock and Dam No. 18, Oklahoma. No maintenance dredging was necessary in FY 1987 on the Arkansas River Navigation System in the Tulsa District.

Sediment forecasting has become a major effort during the past year particularly with the reservoirs located in Kansas. Sediment forecasting programs have been developed to perform this task using historical and current sediment surveys of reservoirs. These surveys are used as a calibration tool prior to making forecasts of future sediment deposition. Conversion from the Southwestern Division Honeywell computer system to the Tulsa District Harris computer system has been another major effort performed during the year. This work is expected to be completed by the end of calendar year 1988. Suspended sediment samples were collected by the U. S. Geological Survey at 39 sites.

During fiscal year 1987, the Tulsa District completed the data processing of the 1986 hydrographic survey of sediment ranges of Conchas Lake, New Mexico. Additionally, the hydrographic survey of sediment ranges, along with data processing, was performed at Cochiti and Santa Rosa Lakes, New Mexico, for the Albuquerque District. A hydrographic survey was performed on Lake Naswothy, Texas, for a flood insurance study being done by the Fort Worth District.

5. NAVIGATION ACTIVITIES.

a. ALBUQUERQUE DISTRICT. N/A

b. FORT WORTH DISTRICT. N/A.

c. GALVESTON DISTRICT. Consolidated statement of tonnage handled by ports and moving on the Gulf Intracoastal Waterway is shown in the following table for calendar years 1984 and 1985.

	(SHORT TONS) CALENDAR YEAR 1984	CALENDAR YEAR 1985
1. Brownsville, Texas	1,481,422	1,442,790
2. Port Isabel, Texas	257,781	279,578
3. Corpus Christi, Texas	44,081,109	41,057,313
4. Freeport, Texas	15,122,761	12,918,289
5. Galveston, Texas	11,752,974	7,791,729
6. Houston, Texas	96,777,619	90,669,169
7. Texas City, Texas	30,656,673	33,440,917
8. Sabine Pass Harbor, Texas	605,050	547,160
9. Port Arthur, Texas	16,430,368	15,754,931
10. Beaumont, Texas	33,004,372	26,842,008
11. Orange, Texas	452,488	648,350
12. Port Lavaca-Point Comfort	3,636,922	4,365,748
13. Anahuac, Texas	6,242	52,859

(cont't)

	(SHORT TONS) CALENDAR YEAR 1984	CALENDAR YEAR 1985
14. Clear Creek, Texas	58,726	------
15. Channel to Liberty, Texas	3,024	58,486
16. Double Bayou, Texas	2,412	20,845
17. Cedar Bayou, Texas	391,946	218,608
18. Colorado River, Texas	324,075	480,181
19. Sweeney, Texas	619,837	519,417
20. Palacios, Texas	0	10,116
21. Dickinson, Texas	176,905	194,932
22. Aransas Pass, Texas	3,314	9,649
23. Port Mansfield, Texas	57,894	204,007
24. Harlingen, Texas	801,003	692,170
25. Channel to Victoria, Texas	3,674,375	3,414,087
26. Chocolate Bayou, Texas	3,401,910	4,076,999
27. Johnsons Bayou	140,357	248,959
28. Rockport, Texas	0	0
TOTAL	263,921,559	245,959,297
Gulf Intracoastal Waterway, Texas (Traffic on Waterway)		
Sec. 1. (Sabine River to Galveston	43,810,015	42,443,030
Sec. 2. (Galveston to Corpus Christi	20,991,540	22,937,710
Sec 3 (Corpus Christi to Mexican Border)	1,877,348	2,128,564
TOTAL (1)	66,678,903	67,509,304

(1) Includes duplications.

In reproducing, wholly or in part, data contained herein, indicate source.

d. LITTLE ROCK DISTRICT. Projections indicate that about 9.0 million tons of commerce will be moved on the McClellan-Kerr Arkansas River Navigation System in CY 1987 level. Commodities moved consisted of iron and steel, chemicals and chemical fertilizers, petroleum products, coal, sand and gravel, rock, soybeans, wheat, other grains, and miscellaneous commodities. Inbound movements are predicted to increase by 12 percent and outbound movements to increase by 13 percent.

	1986* (Tons)	1987** (Tons)
Inbound	2,607,581	2,321,000
Outbound	2,607,581	3,200,000
Internal	2,962,089	2,804,000
Through	679,577	675,000
	9,702,632	9,000,000

* Official figures
** Projected figures

e. TULSA DISTRICT. Commercial movements in Oklahoma for FY 1987 were about 10 percent less than in 1986. Petroleum products and chemical fertilizers showed the greatest gain while all other commercial movements slumped. The inbound-outbound tonnage ratio has increased to about 1:2.2, from about 1:7 in 1977. High flow rates in October, November, and December of 1986 adversely affected navigation during the year.

6. COOPERATIVE PROGRAMS.

a. ALBUQUERQUE DISTRICT. The cooperative stream gaging program with the U. S. Geological Survey covered 37 stations in FY 1987. The total program cost for FY 1987 is shown in Table VI-I. Total CE/USGS program cost for FY 1988 will be $216,070. The following is a summary of stations by river basin:

STATION SUMMARY

BASIN	STREAM	RESERVOIR	TOTAL
Arkansas	5	2	7
Canadian	3	1	4
Rio Grande	11	4	15
Pecos	8	3	11

NOTE: 6 gages are not associated with project operation.

b. FORT WORTH DISTRICT.

(1) National Weather Service. Funds were transferred by SWF to the NWS in the amount of $103,439 for FY 1987. Under ongoing programs, the Corps collects rainfall at project offices while the NWS collects all other rainfall reports and maintains weather stations, including those at Coprs' projects. Rainfall summaries are transmitted to the Corps via teletype, telephone, and a daily computer printed map which displays current totals for reporting stations. Supplemental and accumulative storm total printouts are provided upon request. Additional hydro-meteorological information was received from the NWS via the teletype circuits and AFOS. Radar scans were obtained on a Kavouras radar acquisition access and display terminal via a direct connection to the NWS Stephenville radar site (which covers the geographic area where the majority of the Distric's projects are concentrated) and via commercial long-distance telephone into NWS radar sites at Galveston, Hondo, and Brownsville, Texas, and into Oklahoma City, Oklahoma. Continuous updates are possible during storm periods.

(2) U. S. Geological Survey.

a. General. The USGS performed operation and maintenance on all streamflow, lake level, and some water quality stations in cooperation with the District. In addition, they arranged for reporting at river stages during flood events, made supplemental flow measurements, and processed all published data.

b. Funds. The Fort Worth District transferred to the USGS, for the Cooperative Stream Gaging Program, a total of $682,540 in FY 1987. Table VI-2 indicates the number of stations and the funds provided by both the USGS and the CE toward the total station cost. Total CE/USGS program cost for FY 1988 will be $671,270.

c. GALVESTON DISTRICT.

(1) U. S. Geological Survey. Two cooperative programs are currently in existence with the USGS. One provides the operation and maintenance of stream gages and the second provides the operation and minor maintenance for Data Collection Platforms. The total program cost for FY 1987 is shown in Table VI-3. The total CE/USGS program cost for FY 1988 will be $165,720.

(2) National Weather Service. The cooperative program with the NWS provides for the operation and maintenance of precipitation gages and for the transmission of rainfall summaries via teletype circuits. The total program cost for FY 1987 was $8,639. The total program cost for FY 1988 will be $7,174.

d. LITTLE ROCK DISTRICT. Approximately 202 rainfall and/or river stage reporting stations were operated by the National Weather Service and the Corps of Engineers in or near the Little Rock District. Of these, 117 stations are in the Corps of Engineers/National Weather Service program. The remaining 85 stations are operated solely by the National Weather Service within or near the Little Rock District. Six of these stations are airway stations that report at 6-hour intervals.

Reports from these stations are used in forecasting streamflows for flood warning and operation of reservoir projects. The streamgaging data required by the District is collected under a cooperative agreement with the USGS. During the fiscal year 109 stations were operated. Of these, 72 were operated cooperatively and 37 were operated by the Corps of Engineers. The FY 1987 total cost for collection of streamflow and sediment data was $513,410 of which $377,400 was transferred to the USGS. See Table VI-4 for FY 1987 cost breakdown. The FY 1988 cooperative total CEW/USGS program cost is $402,070.

e. TULSA DISTRICT.

(1) Stream Gaging Program. Much of the information required for water control, hydrologic investigation, and design of water resources projects results from the reporting and measurement of flow, water quality, and sediment provided by a cooperative stream gaging program with the USGS. During FY 1987, this cooperative program included 194 stations, six of which were operated independently by the Corps of Engineers. The stream

gaging program in the Tulsa District cost $1,456,292 in FY 1987 with $848,440 of this being transferred to the USGS for operation of stations and data publications. Table VI-5 shows a breakdown of the program class of funds used to finance the program. The total CE/USGS program cost for FY 1988 will be $989,740.

(2) Reporting Network Program. Real-time water control and investigation and design of our water resources projects requires the measurement and reporting of rainfall and evaporation data. These data are provided through a cooperative program with the National Weather Service. During FY 1987, the rainfall and evaporation program in the Tulsa District cost $154,092 through transfer of funds to the National Weather Service.

7. ANNUAL FLOOD DAMAGES PREVENTED, PER RIVER BASIN, BY BOTH CORPS AND SECTION 7 PROJECTS.

a. ALBUQUERQUE DISTRICT. The following is a listing of damages prevented by Corps and Section 7 projects during FY 1987.

DAMAGES PREVENTED IN THOUSANDS OF DOLLARS

BASIN	PROJECT	DAMAGES PREVENTED
Arkansas	John Martin	15,721
	Pueblo	90
	Trinidad	0
Canadian	Conchas	0
Rio Grande	Abiquiu	38,891
	Cochiti	57,108
	Galisteo	0
	Jemez Canyon	1,851
	Platoro	552
	Rio Grande Floodway	1,148
	Albuquerque Div. Channel	6,786
Pecos	Santa Rosa	0
	Sumner	0
	Two Rivers	0
San Juan	Navajo	50

b. FORT WORTH DISTRICT. Annual flood damages, per River Basin, prevented by both Corps' and Section 7 Projects are shown in the following table.

FLOOD CONTROL BENEFITS - FISCAL YEAR 1987

PROJECT	FY 1987 PREVENTED (in $1,000'S)	CUMULATIVE THROUGH FY 1987 (in $1,000'S)
BRAZOS RIVER BASIN		
Aquilla	$ 672.9	$ 1,234.0
Belton	3,277.7	118.135.5
Georgetown	577.5	4,606.1
Granger	3,089.0	14.416.1
Proctor	937.8	7.721.4
Somerville	1,067.5	32,184.0
Stillhouse	2,496.9	25,306.2
Waco	1,322.0	60,053.9
Whitney	3,260.8	134,777.0
Subtotal	$ 16,702.1	$ 398,444.2
COLORADO RIVER BASIN		
Hords Creek	$ 0.0	$ 937.0
O. C. Fisher	0.0	2,375.6
Subtotal	$ 0.0	$ 3,312.6
GUADALUPE-SAN ANTONIO RIVER BASIN		
Canyon	$ 4,268.1	$ 58,878.3
San Antonio	12,209.4	117,514.9
Subtotal	$ 16,477.5	$ 176,393.2
NECHES RIVER BASIN		
Sam Rayburn	$ 45,479.0	$ 127,494.4
	$ 45,479.0	$ 127,494.4
RED RIVER BASIN		
Lake O' The Pines	$ 0.0	$ 6,139.0
Wright Patman	0.0	13,697.0
Subtotal	$ 0.0	$ 19,836.0
TRINITY RIVER BASIN		
Bardwell	$ 11.9	$ 9,112.7
Benbrook 1/	939.1	51,449.4
Big Fossil	0.0	6,322.8
Grapevine 2/	63,477.4	942,720.3
Joe Pool	1,122.1	1,764.8

FLOOD CONTROL BENEFITS - FISCAL YEAR 1987

(Con't)

PROJECT		FY 1987 DAMAGES PREVENTED (in $1,000's)	CUMULATIVE BENEFITS THROUGH FY 1987 (in $1,000's)
Lavon		2,916.1	91,035.1
Navarro Mills		375.4	27,732.0
	Subtotal	$ 68,842.0	$1,130,137.1
COLORADO RIVER BASIN			
Marshall Ford		$ 7,411.0	$ 190,893.6
Twin Buttes		0.0	418.0
	Subtotal	$ 7,411.0	$ 191,311.6
	Grand Total	$ 154,811.6	$2.046,929.1

1/ Includes Fort Worth Flooodway System
2/ Includes Lewisville and Dallas Floodway System
3/ Built by Bureau of Reclamation but under Corps Flood Control Jurisdiction

c. GALVESTON DISTRICT. Annual flood damages prevented by Corps projects are given in the following table. There are no Section 7 projects within the District.

	Flood Damages Prevented ($000) Total for FY 1987	Cumulative Total
Addicks and Barker	34,792.0	161,754
Brays Bayou	1,132.0	208,677
White Oak Bayou	78.4	20,917
Lavaca-Navidad Rivers	0	637
Tranguitas Creek	0	5,333
San Diego Creek	0	2,908
Texas City, Texas (Hurricane-Flood)	0	10,614
Colorado River, Matagorda	0	844
Galveston Seawall	0	400,000
Vince Bayou	0	2,582
Port Arthur (Hurricane-Flood)	0	6,000
Freeport (Hurricane-Flood and Tide Gate)	0	8,000
Nueces River (Three Rivers)	0	0
	36,002.4	823,266

b. LITTLE ROCK DISTRICT. The table below presents the flood damages prevented in Little Rock District basins in FY 87.

ANNUAL FLOOD DAMAGES PER RIVER BASIN PREVENTED BY CORPS PROJECTS - FY 1987

	FY 1987 Damages Prevented $
ARKANSAS RIVER BASIN	
Little Rock District Projects	140,940,000
WHITE RIVER BASIN	
Little Rock District Projects	10,860,000
LITTLE RIVER BASIN	
Little Rock District Projects	651,000
Total for LRD Levees and Reservoirs	152,451,000

e. TULSA DISTRICT. Flood damages prevented by the Tulsa District Lakes in the Arkansas and Red River Basins during FY 1987 are shown in the following table.

FLOOD DAMAGES PREVENTED BY COMPLETED AND ESSENTIALLY COMPLETED PROJECTS - TULSA DISTRICT (ARRANGED BY BASIN).

ARKANSAS RIVER BASIN	FY 1987	CUMULATIVE THROUGH FY 1987
Arcadia	---	1,065,000
Big Hill	308,000	375,000
Birch	1,730,000	7,302,000
Canton	1,316,000	8,071,000
Cheney	6,302,000	13,936,000
Copan	72,336,000	93,591,000
Council Grove	693,000	17,452,000
El Dorado	13,201,000	14,338,000
Elk City	9,855,000	50,807,000
Eufaula	13,703,000	59,805,000
Fall River	5,675,000	39,265,000
Fort Gibson	9,919,000	44,310,000
Fort Supply	55,000	3,166,000
Great Salt Plains	22,046,000	37,447,000
Heyburn	446,000	7,447,000
Hulah	103,400,000	199,279,000
Iola	1,320,000	12,677,000
John Redmond	7,583,000	80,818,000
Jenks	564,000	2,300,000
Kaw	231,563,000	256,536,.000

FLOOD DAMAGES PREVENTED BY COMPLETED AND ESSENTIALLY COMPLETED PROJECTS - TULSA DISTRICT (ARRANGED BY BASIN).

(Cont'd)

Keystone	266,936,000	394,614,000
Marion	158,000	36,144,000
Markham Ferry	2,114,000	7,933,000
Norman	2,813,000	11,526,000
Oologah	24,308,000	81,316,000
Optima	---	11,000
Pensacola	7,641,000	47,188,000
Sanford	152,000	162,000
Skiatook	11,485,000	32,004,000
Tenkiller	3,144,000	15,311,000
Toronto	7,090,000	38,143,000
Tulsa & West Tulsa	146,684,000	258,546,000
Wister	3,510,000	75,872,000
Total Arkansas Basin	978,050,000	1,948,747.000
RED RIVER BASIN		
Altus	427,000	3,763,000
Arbuckle	28,000	452,000
Broken Bow	311,000	15,534,000
Denison	1,220,000	64,496,000
Fort Cobb	34,000	687,000
Foss	1,516,000	2,789,000
Hugo	355,000	7,929,000
Lake Kemp	17,000	3,170,000
Mountain Park	5,000	599,000
Pat Mayse	161,000	4,191,000
Pine Creek	527,000	11,654,000
Sardis	1,469,000	5,622,000
Waurika	4,920,000	21,185,000
Total Red River Basin	10,990,000	142,072,000
Grand Total	989,040,000	2,090,819,000

8. ANNUAL FLOOD DAMAGES, BY STATE, PREVENTED BY CORPS PROJECTS.

a. ALBUQUERQUE DISTRICT. Annual flood damages prevented by Corps projects during FY 1987 for the States of Colorado, New Mexico and Kansas are shown in the following table.

STATE	DAMAGES PREVENTED (In Thousands of Dollars)
Colorado	552
New Mexico	105,232
Kansas	15,721

b. FORT WORTH DISTRICT. Annual flood damages prevented by Corps projects during FY 1987 in the State of Texas were $147,500,600.

c. GALVESTON DISTRICT. Damages prevented during FY 1987 in the State of Texas by Corps projects were $36,002,400.

d. LITTLE ROCK DISTRICT. This table presents the damages prevented in each state served by the Little Rock District Corps projects.

STATE	FY 1987 Damages Prevented ($1,000)
Arkansas	150,465
Missouri	1,986
TOTAL FY 1987:	152,451

e. TULSA DISTRICT. Annual flood damages prevented by Corps projects in FY 1987 for the State of Kansas amounted to $45,883,000; for Oklahonma, $920,727,000; for Arkansas, $34,918,000, and for Texas $1,381,000.

9. ANNUAL FLOOD DAMAGES, BY STATE, PREVENTED BY CORPS SUPPORTED EMERGENCY OPERATIONS.

a. ALBUQUERQUE DISTRICT.

STATE	DAMAGES PREVENTED (In Thousands of Dollars)
Colorado	800
New Mexico	0

b. FORT WORTH DISTRICT. None.

c. GALVESTON DISTRICT. None.

d. LITTLE ROCK DISTRICT. Primarily the flood damages prevented in FY 1987 by Emergency Operations occurred along the Arkansas River in Arkansas during the October 1986 flood. Emergency Operations were conducted most of October in the Russellville and Pine Bluff Resident areas and at the District Office in Little Rock. Cost of the Emergency Operations was approximately $90,000. The savings resulting from the damages prevented is conservatively estimated at $2,250,000. Undoubtedly, there were many lives, livestock, personal property and equipment saved from the early warning and evacuation provided. No appreciable emergency operations were conducted in the Missouri portion of the District in FY 1987.

e. TULSA DISTRICT. Not Available.

10. HYDROPOWER PRODUCTION..

a. ALBUQUERQUE DISTRICT. N/A.

b. FORT WORTH DISTRICT. Hydropower production by project for Fiscal Years 1983 through 1987 is tabulated as follows:

PROJECT	GROSS GENERATION (MWH)	FISCAL YEAR
Sam Rayburn	147,319	1987
	106,726	1986
	97,971	1985
	125,477	1984
	176,146	1983
Whitney	110,216	1987
	51,900	1986
	57,529	1985
	14,364	1984
	28,548	1983

c. GALVESTON DISTRICT. Not applicable.

d. LITTLE ROCK DISTRICT. The annual hydropower production at LRD plants (total GWH per FY) is shown in the following table. The relatively large 1985 figures are indicative of the high volume of flood water passed that year.

PROJECT	1983	1984	1985	1986	1987
Beaver	174.8	117.8	224.1	215.8	156.6
Table Rock	682.5	473.5	888.3	648.2	434.7
Bull Shoals	1,089.8	702.5	1,402.9	880.5	572.2
Norfork	262.1	211.1	397.3	215.9	127.8
Greers Ferry	346.5	160.0	317.3	150.6	106.9
Ozark	137.2	195.9	439.9	490.6	343.9
Dardanelle	659.7	599.0	826.9	802.8	833.3
Total(GWH)	3,352.6	2,459.8	4,496.7	3,404.6	2,575.4

e. TULSA DISTRICT. Generation at Tulsa District power projects in FY 1987 was the highest it has been during the last 10 fiscal years due to above normal flows in the Arkansas and Upper Red River Basins. Hydropower generation at Tulsa District projects for FY 1983 through 1987 is shown in the following table.

HYDROPOWER PRODUCTION
FOR TULSA DISTRICT PROJECTS

NET ANNUAL GENERATION (GWH)

PROJECT	FY 1983	FY 1984	FY 1985	FY 1986	FY 1987
Denison	189	199	343	295	533
Broken Bow	195	140	230	147	88
Sub Total	384	339	573	442	621
Kaystone	231	234	307	333	501
Fort Gibson	216	204	322	295	288
Webbers Falls	91	190	321	351	287
Tenkiller Ferry	95	78	176	172	148
Eufaula	239	195	360	336	461
Robert S. Kerr	578	526	751	726	773
Sub Total	1,450	1,427	2,237	2,213	2,458
TOTAL	1,834	1,776	2,810	2,655	2,079

11. LAKE ATTENDANCE

a. ALBUQUERQUE DISTRICT. The following is a listing of attendance for Corps and Section 7 projects in the Albuquerque District.

PROJECT ATTENDANCE IN THOUSANDS

PROJECT	1983	1984	1985	1986	1987
Abiquiu	298.5	331.9	331.9	571.4	406.5
Cochiti	498.9	519.5	716.6	978.1	819.7
Conchas	268.6	331.9	449.7	586.7	408.8
Galisteo	5.2	5.1	7.6	8.3	5.8
Jemez Canyon	20.2	44.9	51.0	53.5	53.3
John Martin	639.5	698.9	742.5	702.9	1,012.7
Santa Rosa	182.6	240.8	248.2	233.3	191.6
Trinidad	121.7	164.9	275.4	274.3	282.1
Two Rivers	2.8	11.6	62.7	17.6	13.2
Pueblo	675.0	906.8	1,355.4	1,509.1	1,476.5
Platoro	9.8	21.5	17.4	13.2	8.4
Sumner	142.2	137.7	129.7	138.3	95.5

b. FORT WORTH DISTRICT. Lake attendance for both Corps' and Section 7 Projects for Fiscal Years 1983 through 1987 are presented below.

TOTAL PERSONS VISITING PROJECTS

PROJECT	1983	1984	1985	1986	1987 (Est)
Aquilla	- - -	26,590	100,398	104,087	105,000
Bardwell	977,823	974,819	984,648	769,579	780,000
Belton	2,446,444	2,355,254	2,307,521	2,504,090	2,600,000
Benbrook	2,007,943	3,083,414	2,504,101	2,584,640	2,700,000
Canyon	1,993,582	2,327,006	2,316,739	2,429,188	2,000,000
Georgetown	838,583	889,405	1,064,732	970,472	80,000
Granger	319,600	256,125	322,139	325,597	340,000
Grapevine	4,482,409	4,932,223	4,315,270	4,077,704	4,200,000
Hords Greek	833,248	805,937	577,994	437,050	450,000
Joe Pool	- - -	- - -	- - -	- - -	2,000
Lake O' The Pines	5,243,834	3,116,076	2,392,225	2,434,841	2,400,000
Lavon	2,897,765	3,121,115	4,072,512	3,652,875	3,700,000
Lewisville	6,683,116	6,482,032	5,752,444	7,204,293	7,300,000
Navarro Mills	1,202,752	1,370,974	1,540,478	1,319,467	1,400,000
O. C. Fisher	834,256	1,328,883	787,268	534,689	550,000
Proctor	1,687,763	916,096	962,706	928,187	940,000
Ray Roberts	- - -	- - -	- - -	- - -	1,000
Sam Rayburn	3,304,133	3,094,293	3,258,250	3,319,565	3,400,000

TOTAL PERSONS VISITING PROJECTS

(con't)

Somerville	3,159,744	2,057,820	1,639,849	1,380,058	1,400,000
Stillhouse	909,148	987,303	915,182	1,206,341	1,300,000
Town Bluff	614,215	627,886	707,695	589,243	600,000
Waco	4,335,481	4,683,306	4,599,839	4,891,174	4,900,000
Whitney	2,236,552	2,056,072	2,249,653	2,350,213	3,400,000
Wright Patman	4,829,095	2,220,918	2,320,332	3,072,606	3,100,000
Twin Buttes			Not Available		
Marshall Ford			Not Available		

c. GALVESTON DISTRICT. Not Applicable.

d. LITTLE ROCK DISTRICT Visitation for all Little Rock District lakes by calendar year is as follows:

1983	42,770,000
1984	42,137,000
1985	42,700,000
1986	44,128,000
1987	47,000,000 (estimated)

e. TULSA DISTRICT. Lake attendance figures for calendar years 1983 through August 1987 are tabulated in the following table. Official visitation figures have recently been converted to a visitor hour basis (estimated number of hours spent by all visitors to the project). 1983 and 1985 figures are shown in recreation days (estimated number of persons visiting the project for any length of time). 1986 figures are shown in both visitor hours and recreation days of use, and 1987 figures are shown in the visitor hours only. Lake attendance data for January through August 1987 indicate a slight increase in attendance from 1986.

12. WATER SUPPLY STORAGE.

a. ALBUQUERQUE DISTRICT. Cochiti, Galisteo, Jemez Canyon and Two Rivers projects do not have storage allocated for water supply. The following table is a listing of those reservoirs with space allocated.

STORAGE IN THOUSANDS OF ACRE FEET

PROJECT	STORAGE ALLOCATED	AMOUNT CONTRACTED	NUMBER OF CONTRACT	WATER SUPPLIED FY 1986	FY 1987
Conchas	259	0	0	64.9	68.8
John Martin	345	0	0	158.6	149.1
Santa Rosa	200	0	0	32.5	31.0
Trinidad	20	0	0	30.1	17.8
Abiquiu	200	170.9	1	0	0

TULSA DISTRICT
ATTENDANCE AT CORPS OF ENGINEERS
PROJECTS (IN THOUSANDS)

PROJECT	1983 rec. days	1984 rec. days	1985 rec. days	1986 rec. days	1986 Visitor hours	1987* Visitor hours
Great Salt Plains	433.9	297.4	328.2	432.9	6059.2	6076.0
Fort Supply	789.6	898.7	860.5	729.5	4295.4	7404.0
Canton	2822.0	2738.1	2625.0	2706.1	24764.0	28520.0
Hulah	328.5	428.7	357.7	337.8	1634.3	3142.0
Tenkiller	2133.9	2065.1	2182.0	2379.1	42435.4	40888.0
Wister	881.6	971.1	838.2	771.6	7752.6	7804.0
Keystone	3105.0	2627.3	3262.6	3240.9	16399.9	10753.0
Oologah	2523.7	3003.4	2837.1	2300.0	23031.6	19816.0
Fort Gibson	3544.3	3881.8	4933.9	4493.7	62783.8	39255.0
Fall River	275.0	209.7	192.5	228.3	2797.1	1878.0
Toronto	187.5	145.6	161.9	197.2	4357.0	2774.0
Elk City	269.5	253.1	281.2	280.2	7886.3	2885.0
Optima	190.7	178.1	141.1	131.4	421.2	340.0
Pat Mayse	379.0	370.1	386.8	456.9	3753.9	3214.0
Eufaula	4059.3	4162.5	4607.3	4154.5	57851.1	59282.0
Hayburn	296.1	275.0	280.2	269.8	1847.4	1667.0
Hugo	844.1	937.3	917.2	846.4	4472.0	3577.0
Texoma	9768.2	8342.3	8683.5	8479.1	141609.5	150087.0
Waurika	818.3	850.3	829.6	843.3	4495.3	4547.0
John Redmond	388.0	313.5	242.0	296.2	1654.4	1499.0
Council Grove	512.5	512.0	473.9	473.2	7801.4	5842.0
Broken Bow	967.5	861.0	949.2	906.3	25638.7	17145.0
Marion	281.9	235.3	325.1	317.0	5280.9	4715.0
Pine Creek	727.1	847.9	849.7	983.7	11949.7	5575.0
Robert S. Kerr	1025.8	1042.9	1031.6	1128.2	5807.4	4937.0
W.D. Mayo L&D	210.5	221.0	197.1	244.0	890.6	535.0
Chouteau L&D	291.3	421.6	373.3	348.4	3160.4	2659.0
Newt Graham L&D	379.6	458.6	338.8	239.1	2347.6	1927.0
Webbers Falls	779.9	942.5	1111.4	917.1	13530.2	9092.0
Birch	335.4	343.1	241.6	246.6	1535.1	1099.0
Kaw	1107.8	1051.0	1139.0	1317.9	586.4	3914.0
Big Hill	443.2	431.4	472.4	396.2	2047.2	1845.0
Sardis	31.7	311.9	316.1	310.3	2215.3	978.0
El Dorado	210.6	503.1	525.3	772.6	958.2	6165.0
Copan	8.5	214.4	209.4	213.8	1051.4	1283.0
Skiatook				408.8	4321.7	3565.0
DISTRICT TOTAL	41351.5	41330.0	43503.3	42390.2	509923.6	466684.0

*Total for January through August 1987.

b. FORT WORTH DISTRICT. Water supply information per project is tabulated as follows:

PROJECT NAME	STORAGE CONTRACTED (AC-FT)	STORAGE ALLOCATED (AC-FT)	NUMBER CONTRACTED (USERS)	WATER SUPPLIED IN FY 87 (AC-FT)
Aquilla Lake	33,600	52,480	1	2,100
B. A. Steinhagen Lake	1/	1/	1	1,760,600
Bardwell Lake	21,400	42,800	1	4,000
Belton Lake	372,700	372,700	2	53,400
Benbrook Lake	23,708 2/	23,708 2/	1	3,300
Canyon Lake	366,400	366,400	1	229,600
Georgetown Lake	101	29,200	1	1,200
Granger Lake	0	37,900	1	0
Grapevine Lake	161,250	161,250	3	24,000
Hords Creek Lake	5,780	5,780	1	250
Joe Pool Lake	0	142,900	1	0
Lake O' The Pines	250,000	250,000	1	10,700
Lavon Lake	220,000	220,000 3/	1	90,200
Lewisville Lake	436,000	436,000	2	127,100
Navarro Mills Lake	53,200	53,200	1	6,700
O. C. Fisher Lake	80,400	80,400	1	9,200
Proctor Lake	31,400	31,400	1	17,300
Sam Rayburn Reservoir	43,000 1/	43,000	2	0
Somerville Lake	143,900	143,900	1	9,900
Stillhouse Hollow Lake	204,900	204,900	1	0
Waco Lake	104,100	104,100	2	27,800
Whitney Lake	50,000	50,000	1	160
Wright Patman Lake	91,263	91,263	1	33,300

1/LNVA is permitted to withdraw from B. A. Steinhagen Lake not to exceed 2,000 c.f.s. This lake acts as a reregulation dam to Sam Rayburn Reservoir.

2/ Remaining 48,792 ac-ft of navigation storage is in the process of being negotiated with water user.

3/ NTMWD has given assurances for an additional 160,000 ac--ft of storage in Lavon Lake.

c. GALVESTON DISTRICT. N/A.

d. LITTLE ROCK DISTRICT water supply contracts and usage in FY 1986 and FY 1987 are summarized by project in the following table.

WATER SUPPLY USAGE SUMMARY

PROJECT	Amount of Storage Allocated (AC-FT)	Amount Contracted (AC-FT)	Number of Contracts	Amount of Water Supplied (AC-FT) FY 86	FY 87
Beaver Lake	117,000	40,000	2	29,448	31,165
Greers Ferry Lake	3,215	1,125	2	1,793	1,856
Norfork	2,400	2,400	1	2,322	2,430
Nimrod	33	33	1	82*	92*
Dierks Lake	10,100	190	1	250	238
Millwood Lake	150,000	32,828	1	49,280	53,944
Gillham Lake	20,600	123	1	738	664
DeQueen Lake	17,900	0	0	0	0

* ESTIMATED

e. TULSA DISTRICT. Storage allocated to water supply totals 3,801,240 acre-feet in the Tulsa District. The Corps has 2,184,220 acre-feet in 30 projects while the Section 7 projects totaled 1,725,020 acre-feet in 11 projects. The following Table is a project listing showing water supply storage, yield, amount contracted, number of contracts (existing and pending), and usage.

WATER SUPPLY STORAGE

Corps of Engineers Projects
(October 1987)

PROJECT	STORAGE ALLOCATED TO WATER SUPPLY AF	ESTIMATED YIELD MGD	AMOUNT CONTRACTED AF	NUMBER OF CONTRACTS EXISTING	NUMBER OF CONTRACTS PENDING	AMOUNT SUPPLIED AF FY 86	AMOUNT SUPPLIED AF FY 87
ARKANSAS RIVER BASIN							
ARCADIA	23090	11	23090	1	0	0	0
PEARSON-SKUBITZ BIG HILL	25700	8.5	25700	1	0	564	523
BIRCH	7630	3	0	0	0	0	0
CANTON	107000 (1)	12	0	0	0	34946	0
COPAN	7500	3	5000	1	0	92	94
COUNCIL GROVE	24400	6	24400	1	0	0	0
EL DORADO	142800	22.2	142800	1	0	7476	7959
ELK CITY	24300	10	24300	1	0	0	0
EUFAULA	56000	50	5730	15	1	1565	1055
FORT GIBSON	0	0	0	0	0	13549	14385
FORT SUPPLY	400	0.2	400	1	0	148	137
HEYBURN	2000 (2)	1.7	2000	3	0	1635	1733
HULAH	19800	12.4	19800	4	0	5469	2708
JOHN REDMOND	34900	24.5	34900	1	0	138	217

WATER SUPPLY STORAGE

Corps of Engineers Projects
(October 1987)

PROJECT	STORAGE ALLOCATED TO WATER SUPPLY AF	ESTIMATED YIELD MGD	AMOUNT CONTRACTED AF	NUMBER OF CONTRACTS EXISTING	NUMBER OF CONTRACTS PENDING	AMOUNT SUPPLIED AF FY 86	AMOUNT SUPPLIED AF FY 87
KAW	171200	167	90800	3	0	17267	4347
KEYSTONE	20000	20	18000	1	0	7156	5396
MARION	38300	3	38300	1	0	706	727
OOLOGAH	342600	154	322390	7	1	48314	54307
OPTIMA	76200	4.5	0	0	0	0	0
SKIATOOK	62900	14	4060	2	3	0	0
TENKILLER	25400	16	17260	8	0	4820	5465
TORONTO	400	0.1	400	2	0	67	71
WISTER	14000	20.03	13653	3	0	1710	1355
RED RIVER BASIN							
BROKEN BOW	152500	175	0	0	2	0	0
HUGO	47600	58	44890	3	0	4263	5681
PAT MAYSE	109600	55	109600	1	0	13207	13316
PINE CREEK	49400	84	28800	1	0	33604	33604
SARDIS	297200	140	297200	1	0	0	0
TEXOMA (3)	150000	150	114956	5	2	3460	120
WAURIKA	151400	36.2	41800	1	0	5328	4901

WATER SUPPLY STORAGE

Section 7 Projects
(October 1987)

PROJECT (4)	STORAGE ALLOCATED TO WATER SUPPLY AF	AMOUNT WITHDRAWN AF FY 86	FY 87
ARKANSAS RIVER BASIN			
CHENEY	146980	22217	27445
HUDSON	0	0	0
MEREDITH	499700	74368	64169
THUNDERBIRD	105900	15133	16212
RED RIVER BASIN			
ALTUS	122900	35535	41332
ARBUCKLE	62570	10336	7489
FORT COBB	78350	9349	9204
FOSS	243670	2324	1992
LAKE KEMP	268000	89588	47991
MOUNTAIN PARK	88950	3483	4210
MOGEE CREEK	108000	0	0

(1) Based on 1979 sedimentation survey.
(2) Estimated storage to be available in year 2000.
(3) Joint water supply and power provided between elevation 617.0 - 590.0.
(4) Estimated yield and contract information not available.

TABLE VI - 1

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

ALBUQUERQUE DISTRICT

	GENERAL INVESTIGATIONS		CONSTRUCTION GENERAL					CORPS	
	STUDIES	GEN. COV	PLAN AE&D	PROJ. CONST	O&M	MR&T	CORPS TOTAL	PER-CENT	PROGRAM SUPPORT
FUNDS (DOLLARS)									
GAGE CLASS - SW	0	7,600	0	0	188,480	0	196,080	93	211,280
- QW	0	0	0	0	0	0	0	0	0
- SS	4,790	0	0	0	0	0	4,790	100	4,790
- OT	0	0	0	0	0	0	0	0	0
TOTAL	4,790	7,600	0	0	188,480	0	200,870	93	216,070
PERCENT	2.4	3.8	0.0	0.0	93.8	0.0	100.0		
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	0.0	1.2	0.0	0.0	39.4	0.0	40.7	95	43.0
- QW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
- SS	1.0	0.0	0.0	0.0	0.0	0.0	1.0	100	1.0
- OT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
TOTAL	1.0	1.2	0.0	0.0	39.4	0.0	41.7	95	44.0

NUMBER OF GAGING STATIONS/SITES: 44

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 44
NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

TABLE VI - 2

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

FORT WORTH DISTRICT

	GENERAL INVESTIGATIONS		CONSTRUCTION GENERAL					CORPS	
	STUDIES	GEN. COV	PLAN AE&D	PROJ. CONST	O&M	MR&T	CORPS TOTAL	PER-CENT	PROGRAM SUPPORT
FUNDS (DOLLARS)									
GAGE CLASS - SW	0	0	0	1,110	450,000	0	451,110	94	477,970
- QW	0	0	0	0	212,350	0	212,350	90	236,090
- SS	0	0	0	0	0	0	0	0	0
- OT	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	1,110	662,350	0	663,460	93	714,060
PERCENT	0.0	0.0	0.0	0.2	99.8	0.0	100.0		
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	0.0	0.0	0.0	3.0	88.8	0.0	91.8	87	105.0
- QW	0.0	0.0	0.0	0.0	27.0	0.0	27.0	90	30.0
- SS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
- OT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
TOTAL	0.0	0.0	0.0	3.0	115.7	0.0	118.7	88	135.0

NUMBER OF GAGING STATIONS/SITES: 114

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 12
NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

TABLE VI - 3

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

GALVESTON DISTRICT

	GENERAL INVESTIGATIONS		CONSTRUCTION GENERAL					CORPS	
	STUDIES	GEN. COV	PLAN AE&D	PROJ. CONST	O&M	MR&T	CORPS TOTAL	PER-CENT	PROGRAM SUPPORT
FUNDS (DOLLARS)									
GAGE CLASS - SW	4,190	0	0	7,080	147,960	0	159,230	86	184,460
- QW	0	0	0	0	0	0	0	0	0
- SS	0	0	0	0	0	0	0	0	0
- QT	0	0	0	0	0	0	0	0	0
TOTAL	4,190	0	0	7,080	147,960	0	159,230	86	184,460
PERCENT	2.6	0.0	0.0	4.4	92.9	0.0	100.0		
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	0.6	0.0	0.0	1.0	26.6	0.0	28.2	86	33.0
- QW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
- SS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
- QT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
TOTAL	0.6	0.0	0.0	1.0	26.6	0.0	28.2	86	33.0

NUMBER OF GAGING STATIONS/SITES: 33

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 17
NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

TABLE VI - 4

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

LITTLE ROCK DISTRICT

	GENERAL INVESTIGATIONS		CONSTRUCTION GENERAL				CORPS		
	STUDIES	GEN. COV	PLAN AE&D	PROJ. CONST	O&M	MR&T	CORPS TOTAL	PER-CENT	PROGRAM SUPPORT
FUNDS (DOLLARS)									
GAGE CLASS - SW	10,920	5,480	0	0	351,390	0	367,790	78	470,760
- QW	0	0	0	0	17,500	0	17,500	97	18,100
- SS	0	1,920	0	0	6,660	0	8,580	59	14,620
- OT	0	0	0	0	0	0	0	0	0
TOTAL	10,920	7,400	0	0	375,550	0	393,870	78	503,480
PERCENT	2.8	1.9	0.0	0.0	95.3	0.0	100.0		
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	3.0	2.6	0.0	0.0	51.3	0.0	56.9	79	72.0
- QW	0.0	0.0	0.0	0.0	6.9	0.0	6.9	99	7.0
- SS	0.0	7.0	0.0	0.0	5.2	0.0	12.2	76	16.0
- OT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
TOTAL	3.0	9.6	0.0	0.0	63.4	0.0	76.0	80	95.0

NUMBER OF GAGING STATIONS/SITES: 74

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 18
NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

TABLE VI - 5

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

TULSA DISTRICT

	GENERAL INVESTIGATIONS		CONSTRUCTION GENERAL				CORPS		
	STUDIES	GEN. COV	PLAN AE&D	PROJ. CONST	O&M	MR&T	CORPS TOTAL	PER-CENT	PROGRAM SUPPORT
FUNDS (DOLLARS)									
GAGE CLASS - SW	0	0	0	0	884,300	0	884,300	69	1,288,560
- QW	0	0	0	0	85,890	0	85,890	100	86,275
- SS	0	0	0	0	15,950	0	15,950	100	15,950
- OT	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	986,140	0	986,140	71	1,390,785
PERCENT	0.0	0.0	0.0	0.0	100.0	0.0	100.0		
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	0.0	0.0	0.0	0.0	136.6	0.0	136.6	71	192.0
- QW	0.0	0.0	0.0	0.0	9.0	0.0	9.0	100	9.0
- SS	0.0	0.0	0.0	0.0	40.0	0.0	40.0	100	40.0
- OT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
TOTAL	0.0	0.0	0.0	0.0	185.6	0.0	185.6	77	241.0

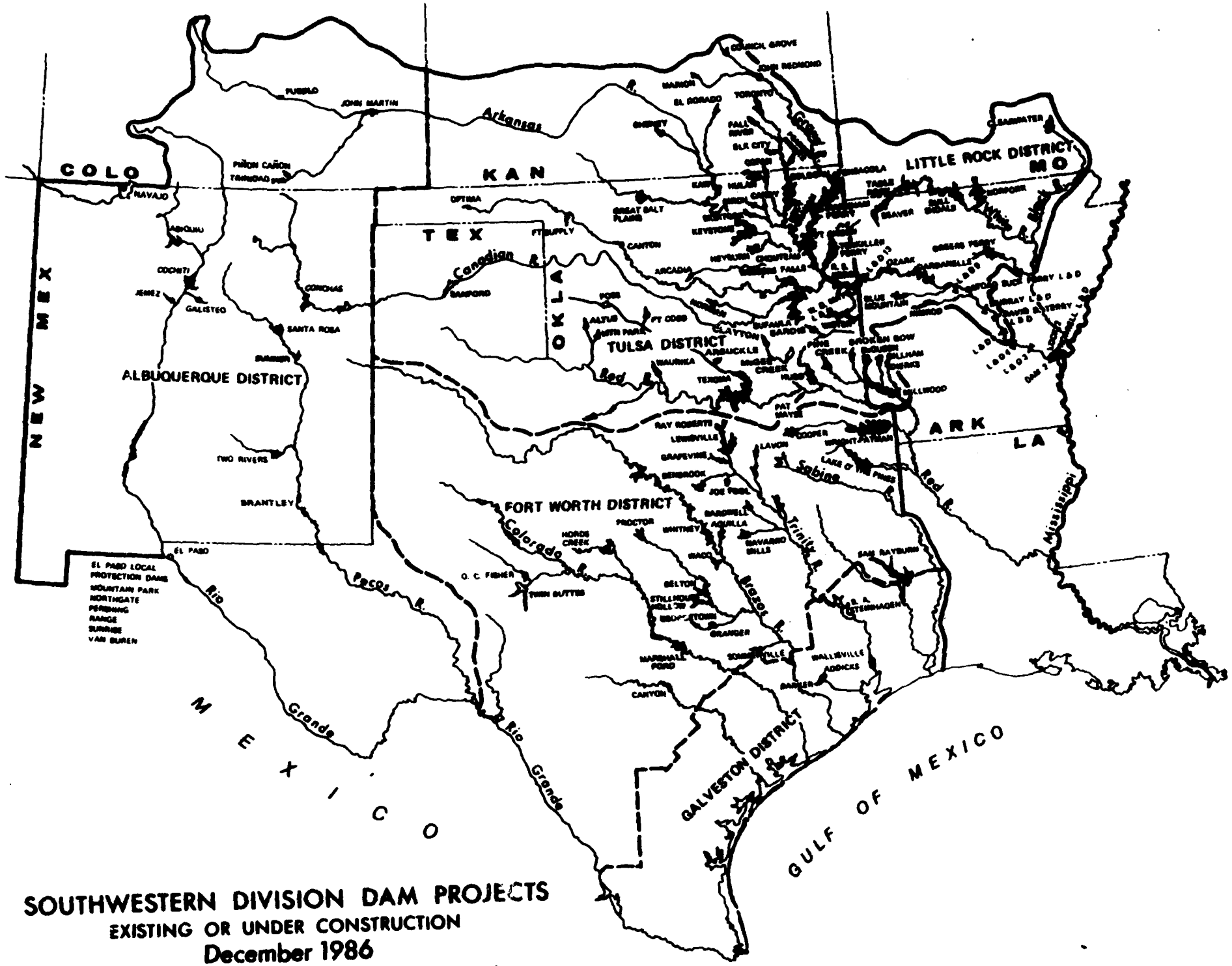
NUMBER OF GAGING STATIONS/SITES: 196

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 52
NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

SECTION VII - RESERVOIR DATA SUMMARY

1. SWD MAP
2. INDEX BY BASINS
3. INDEX IN ALPHABETICAL ORDER
4. DATA TABLES



SOUTHWESTERN DIVISION DAM PROJECTS

EXISTING OR UNDER CONSTRUCTION

December 1986

(WITH SECTION 7 FLOOD CONTROL PROJECTS ADDED)

LAKE SUMMARY TABLE INDEX

LAKE NAME	STREAM	DIST	STATE	YR COMP	POOL ELEVATION CONS	POOL ELEVATION FC	CAPACITY** 1000 AF CONS	CAPACITY** 1000 AF FC	PAGE NO
			WHITE RIVER BASIN						
BEAVER	WHITE	LRD	AR	66	1120.00	1130.00	1652	300	1
TABLE ROCK	WHITE	LRD	AR/MO	58	915.00	931.00	2702	760	1
BULL SHOALS	WHITE	LRD	AR/MO	52	654.00	695.00	3048	2360	2
NORFORK	NORTH FORK	LRD	AR/MO	45	552.00	580.00	1251	732	2
CLEARWATER	BLACK	LRD	MO	48	494.00	567.00	22	391	3
GREERS FERRY	LITTLE RED	LRD	AR	62	461.00	487.00	1119	934	3
			ARKANSAS RIVER BASIN						
PUEBLO	ARKANSAS	AD*	CO	74	4880.60	4898.70	264	93	4
TRINIDAD	PURGATORIE R	AD	CO	78	6226.40	6260.00	64	58	4
JOHN MARTIN	ARKANSAS	AD	CO	51	3851.00	3870.00	351	270	5
CHENEY	N F NINNESCAH	TD*	KS	64	1421.60	1429.00	167	81	5
ELDORADO	WALNUT	TD	KS	80	1339.00	1347.50	157	79	6
KAW	ARKANSAS	TD	OK/KS	76	1010.00	1044.50	429	919	6
GREAT SALT PLAINS	SALT FORK ARK	TD	OK	41	1125.00	1138.50	31	240	7
KEYSTONE	ARKANSAS	TD	OK	64	723.00	754.00	618	1219	7
HEYBURN	POLECAT CR	TD	OK	50	761.50	784.00	7	48	8
TORONTO	VERDIGRIS R	TD	KS	60	901.50	931.00	22	178	8
FALL RIVER	FALL	TD	KS	49	948.50	987.50	24	235	9
ELK CITY	ELK	TD	KS	66	792.00	825.00	34	256	9
BIG HILL	BIG HILL CR	TD	KS	81	858.00	867.50	27	13	10
OOLOGAH	VERDIGRIS R	TD	OK	63	638.00	661.00	553	966	10
HULAH	CANEY	TD	OK/KS	51	733.00	765.00	36	258	11
COPAN	L CANEY	TD	OK/KS	80	710.00	732.00	43	184	11
BIRCH	BRICH CREEK	TD	OK	79	750.50	774.00	19	39	12
SKIATOOK	HOMINY CREEK	TD	OK	82	714.00	729.00	305	182	12
NEWT GRAHAM LD 18	VERDIGRIS	TD	OK	70	532.00	.00	24	0	13
CHOUTEAU LD 17	VERDIGRIS	TD	OK	70	511.00	.00	23	0	13
COUNCIL GROVE	NEOSHO R	TD	KS	65	1270.00	1289.00	38	76	14
MARION	COTTONWOOD R	TD	KS	68	1350.50	1358.50	86	60	14
JOHN REDMOND	NEOSHO R	TD	KS	64	1039.00	1068.00	82	563	15
PENSACOLA (GRAND LAKE)	NEOSHO (GRAND)	TD*	OK	40	745.00	755.00	1672	525	15
LAKE HUDSON	NEOSHO (GRAND)	TD*	OK	64	619.00	636.00	200	244	16
FORT GIBSON	NEOSHO (GRAND)	TD	OK	52	544.00	582.00	365	919	16
WEBBERS FALLS LD 16	ARKANSAS	TD	OK	70	490.00	.00	165	0	17
TENKILLER FERRY	ILLINOIS R	TD	OK	52	632.00	667.00	654	577	17
CONCHAS	CANADIAN R	AD	NM	39	4201.00	4218.00	330	198	18
SANFORD (MEREDITH)	CANADIAN R	TD*	TX	65	2941.30	2965.00	945	463	18
NORMAN (THUNDERBIRD)	LITTLE R	TD*	TX	65	1039.00	1049.40	120	77	19
OPTIMA	N CANADIAN R	TD	OK	78	2763.50	2779.00	129	101	19
FORT SUPPLY	WOLF CR	TD	OK	42	2004.00	2028.00	14	87	20
CANTON	N CANADIAN R	TD	OK	48	1615.20	1638.00	116	268	20
ARCADIA	ARKANSAS	TD	OK	86	1006.00	1029.50	28	65	21
EUFAULA	CANADIAN R	TD	OK	64	585.00	597.00	2329	1470	21
R S KERR LD 15	ARKANSAS	TD	OK	70	460.00	.00	494	0	22

LAKE SUMMARY TABLE INDEX

LAKE NAME	STREAM	DIST	STATE	YR CONP	POOL ELEVATION CONS	POOL ELEVATION FC	CAPACITY** 1000 AF CONS	CAPACITY** 1000 AF FC	PAGE NO
W D MAYO LD 14	ARKANSAS	TD	OK	70	413.00	.00	16	0	22
WISTER	POTEAU R	TD	OK	49	471.60	502.50	27	400	23
LD 13	ARKANSAS	LRD	AR/OK	69	392.00	.00	54	0	24
OZARK-J T LD 12	ARKANSAS	LRD	AR	69	372.00	.00	148	0	24
DARDANELLE LD 10	ARKANSAS	LRD	AR	64	338.00	.00	486	0	25
BLUE MOUNTAIN	PETIT JEAN	LRD	AR	47	384.00	419.00	25	233	25
LD 9	ARKANSAS	LRD	AR	69	287.00	.00	65	0	26
TOAD SUCK FERRY LD 8	ARKANSAS	LRD	AR	69	265.00	.00	35	0	26
NIMROD	FOURCHE LA FAVE	LRD	AR	42	342.00	373.00	29	307	27
MURRAY LD 7	ARKANSAS	LRD	AR	69	249.00	.00	87	0	27
DD TERRY LD 6	ARKANSAS	LRD	AR	68	231.00	.00	50	0	28
LD 5	ARKANSAS	LRD	AR	68	213.00	.00	65	0	28
LD 4	ARKANSAS	LRD	AR	68	196.00	.00	70	0	29
LD 3	ARKANSAS	LRD	AR	68	182.00	.00	46	0	29
LD 2	ARKANSAS	LRD	AR	67	162.00	.00	110	0	30
LD 1	ARKANSAS	LRD	AR	67	142.00	.00	2	0	30
			RED RIVER BASIN						
ALTUS	N F RED	TD*	OK	46	1559.00	1562.00	141	21	31
MOUNTAIN PARK (TOM STD.)	W OTTER CREEK	TD*	OK	75	1411.00	1414.00	96	20	32
LAKE KEMP	WICHITA R	TD*	TX	77	1144.00	1156.00	299	225	32
WAURIKA	BEAVER CREEK	TD	OK	78	951.40	962.50	203	140	33
FOSS	WASHITA	TD*	OK	61	1562.00	1668.60	256	181	33
FORT COBB	COBB CREEK	TD*	OK	59	1342.00	1354.80	78	64	34
ARBUCKLE	ROCK CREEK	TD*	OK	67	872.00	885.30	72	36	34
LAKE TEXOMA	RED	TD	TX/OK	45	617.30	640.00	2836	2660	35
PAT MAYSE	SANDERS CREEK	TD	TX	68	451.00	460.50	124	65	36
SARDIS	JACK FORK CREEK	TD	OK	84	599.00	607.00	302	128	36
HUGO	KIAMICHI R	TD	OK	74	404.50	437.50	157	809	37
PINE CREEK	LITTLE R	TD	OK	69	443.50	480.00	78	388	37
BROKEN BOW	MOUNTAIN FORK	TD	OK	69	599.50	627.50	919	450	38
DEQUEEN	ROLLING FORK	LRD	AR	77	437.00	473.50	35	101	39
GILLHAM	COSSATOT	LRD	AR	76	502.00	569.00	33	189	38
DIERKS	SALINE R	LRD	AR	76	526.00	557.50	30	67	40
MILLWOOD	LITTLE R	LRD	AR	66	259.20	287.00	207	1653	40
WRIGHT PATMAN	SULPHER RIVR	FWD	TX	56	220.00	259.50	143	2509	41
LAKE O THE PINES	CYPRESS CREEK	FWD	TX	60	228.50	249.50	251	580	41
McGEE CREEK	McGEE CREEK	TD*	OK	87	577.00	595.50	113	199	35
			NECHES RIVER BASIN						
SAM RAYBURN	ANGELINA R	FWD	TX	65	164.40	173.00	2898	1009	42
B A STEINHAGEN	NECHES R	FWD	TX	51	81.00	83.00	70	24	42
			TRINITY RIVER BASIN						
BENBROOK	CLEAR FORK	FWD	TX	52	694.00	724.00	88	170	43
JOE POOL	MOUNTAIN CREEK	FWD	TX	86	522.00	536.00	143	123	43
RAY ROBERTS	ELM FORK	FWD	TX	87	632.50	640.50	749	260	44
LEWISVILLE	ELM FORK	FWD	TX	54	515.00	532.00	465	525	44
GRAPEVINE	DENTON CR	FWD	TX	52	535.00	560.00	189	248	45

LAKE SUMMARY TABLE INDEX

LAKE NAME	STREAM	DIST	STATE	YR COMP	POOL ELEVATION CONS	POOL ELEVATION FC	CAPACITY** 1000 AF CONS	CAPACITY** 1000 AF FC	PAGE NO
LAVON	EAST FORK	FWD	TX	77	492.00	503.50	457	277	45
NAVARRO MILLS	RICHLAND CR	FWD	TX	68	424.50	443.00	63	149	46
BARDWELL	WAXAHACHIE CR	FWD	TX	65	421.00	439.00	55	85	46
			SAN JACINTO RIVER BASIN						
BARKER	BUFFALO BAYOU	GD	TX	45	.00	107.00	0	207	47
ADDICKS	BUFFALO BAYOU	GD	TX	48	.00	114.00	0	205	47
			BRAZOS RIVER BASIN						
WHITNEY	BRAZOS	FWD	TX	51	533.00	571.00	627	1372	48
AQUILLA	AQUILLA	FWD	TX	83	537.50	556.00	34	87	48
WACO	BOSQUE	FWD	TX	65	455.00	500.00	153	574	49
PROCTOR	LEON R	FWD	TX	63	1162.00	1197.00	59	315	49
BELTON	LEON R	FWD	TX	54	594.00	631.00	458	640	50
STILLHOUSE H	LAMPASAS R	FWD	TX	68	622.00	666.00	236	395	50
GEORGETOWN	N F SAN GABRIEL	FWD	TX	79	791.00	834.00	37	93	51
GRANGER	SAN GRBRIEL	FWD	TX	79	504.00	524.00	66	179	51
SOMERVILLE	YEGUA CR	FW	TX	67	238.00	258.00	160	347	52
			COLORADO RIVER BASIN						
TWIN BUTTES	S&M CONCHO R	FWD*	TX	63	1940.20	1969.10	186	454	53
O C FISHER	N CONCHO R	FWD	TX	52	1908.00	1938.50	119	277	53
HORDS CR	HORDS CR	FWD	TX	48	1900.00	1920.00	9	17	54
MARSHALL FORD	COLORADO R	FWD*	TX	40	681.00	714.00	1172	780	54
			GUADALUPE RIVER BASIN						
CANYON	GUADALUPE R	FWD	TX	64	909.00	943.00	386	355	55
			COLORADO RIVER BASIN						
NAVAJO	SAN JUAN	AD*	NM	62	5990.00	6085.00	-	-	56
			RIO GRANDE BASIN						
PLATORO	CONEJOS R	AD*	CO	51	10027.50	10034.00	54	6	57
ABIQUIU	RIO CHAMA	AD	NM	63	.00	6283.50	0	568	57
COCHITI	RIO GRANDE	AD	NM	75	5321.45	5460.50	47	539	58
GALISTEO	GALISTEO CR	AD	NM	70	.00	5608.00	0	90	58
JEMEZ CANYON	JEMEZ R	AD	NM	53	5160.00	5232.00	2	104	59
SANTA ROSA	PECOS R	AD	NM	80	4776.50	4797.00	267	182	59
SUMNER	PECOS R	AD*	NM	37	4261.00	4282.00	47	86	60
TWO RIVERS	RIO HONDO	AD	NM	63	.00	4032.00	0	168	60

*Section 7 Flood Control Projects
**Includes dead storage, conservation, water supply, power, irrigation, etc.

SUMMARY OF LAKE CONDITIONS FOR WATER YEAR 1987

WHITE RIVER BASIN

BEAVER	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1,000 AC. FT.)													
Avg 1968 thru 1987	55.0	114.9	113.8	74.2	104.7	191.1	169.3	123.2	82.1	21.3	16.0	29.4	1095.0
WY 1987	153.6	63.7	26.0	101.5	140.0	259.1	114.7	71.9	56.9	10.0	8.1	113.3	1118.8
Releases (1,000 AC. FT.)													
Avg 1968 thru 1987	35.9	54.9	86.6	82.4	89.0	95.4	116.4	98.8	83.7	88.3	82.5	55.1	969.0
WY 1987	88.3	74.6	26.8	73.0	150.6	169.9	196.2	41.3	51.2	35.3	25.4	16.1	948.7
Basin Rainfall (inches)													
Avg 1968 thru 1987	4.7	4.4	3.2	2.0	2.4	4.3	4.2	4.9	4.2	2.5	3.3	4.0	44.1
WY 1987	6.2	2.4	.9	3.0	4.6	5.0	2.0	5.8	3.0	3.0	5.1	3.6	44.6
Deviation	1.5	-2.0	-2.3	1.0	2.2	.7	-2.2	.9	-1.2	.5	1.8	-.4	.5
Pool Elevation													
End of Month	1119.93	1119.35	1119.18	1120.03	1119.47	1122.33	1119.12	1119.82	1119.57	1118.21	1117.16	1116.74	
Maximum	1120.18	1120.38	1119.36	1120.39	1120.31	1122.35	1122.35	1119.82	1119.94	1119.57	1118.21	1117.16	
Minimum	1117.75	1119.03	1118.76	1119.18	1118.81	1118.79	1119.12	1118.54	1118.95	1118.21	1117.12	1116.74	
Pool Content EOM													
(1,000 AC. FT.)	1649.9	1633.8	1629.0	1652.8	1637.1	1718.7	1627.3	1646.9	1639.9	1602.0	1573.3	1561.8	

TABLE ROCK LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1,000 AC. FT.)													
Avg 1961 thru 1987	113.8	229.5	237.5	208.2	231.9	391.0	413.9	357.9	227.1	143.2	138.3	100.2	2792.5
WY 1987	320.0	156.2	91.8	212.7	454.6	607.3	396.7	130.1	94.0	73.2	42.1	37.4	2616.1
Releases (1,000 AC. FT.)													
Avg 1961 thru 1987	111.1	184.9	278.0	238.3	210.4	299.6	334.6	322.0	208.6	210.7	165.9	122.0	2686.1
WY 1987	129.8	253.4	188.0	39.1	155.3	522.7	472.2	234.3	102.0	135.8	95.6	64.6	2392.8
Intervening Basin Rainfall (inches)													
Avg 1961 thru 1987	4.7	4.2	3.3	1.8	2.0	4.0	4.2	4.5	4.5	2.8	3.6	3.9	43.5
WY 1987	5.4	2.2	1.0	2.3	4.0	4.1	1.8	4.2	2.8	3.3	4.0	3.0	38.1
Deviation	.7	-2.0	-2.3	.5	2.0	.1	-2.4	-.3	-1.7	.5	.4	-.9	-5.4
Pool Elevation													
End of Month	909.53	906.84	904.13	908.40	915.33	916.97	914.85	911.95	911.26	909.22	907.41	906.35	
Maximum	909.61	910.34	906.84	908.40	915.33	916.97	917.04	914.90	911.99	911.56	909.22	907.41	
Minimum	904.88	906.84	903.69	904.13	908.39	914.10	914.77	911.94	910.75	909.22	907.35	906.35	
Pool Content EOM													
(1,000 AC. FT.)	2474.2	2367.8	2263.9	2429.0	2716.2	2787.7	2695.6	2573.0	2544.7	2461.8	2390.0	2348.6	

WHITE RIVER BASIN

BULL SHOALS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflow (1,000 AC. FT.)													
Avg 1953 thru 1987	146.1	274.7	373.7	295.1	328.6	514.2	546.6	561.4	341.7	369.6	199.4	157.8	4108.1
WY 1987	224.4	292.8	248.8	146.7	407.7	796.0	567.3	296.4	157.5	154.5	147.9	122.6	3562.6
Releases (1,000 AC. FT.)													
Avg 1953 thru 1987	288.7	191.8	284.1	342.6	316.9	361.1	393.1	394.0	310.3	396.7	343.4	246.4	3789.1
WY 1987	282.7	289.7	236.4	45.9	122.2	760.9	532.3	386.8	203.7	210.5	136.8	115.1	3261.0
Basin Rainfall (inches)													
Avg 1953 thru 1987	3.9	4.3	3.0	1.8	2.1	3.6	4.2	4.3	3.4	3.1	3.4	3.9	41.0
WY 1987	5.2	2.1	1.2	2.4	4.2	3.6	1.6	5.1	2.8	3.3	4.3	3.2	39.0
Deviation	1.3	-2.2	-1.8	.6	2.1	.0	-2.6	.8	-.6	.2	.9	-.7	-2.0
Pool Elevation													
End of Month	645.18	644.91	644.90	647.00	653.24	653.61	653.90	651.34	649.69	647.78	647.53	647.24	
Maximum	645.91	645.36	646.27	647.03	653.24	655.86	654.75	654.01	651.41	649.69	648.19	647.54	
Minimum	644.98	643.74	644.39	644.87	647.00	653.24	652.86	651.34	649.68	647.63	647.27	646.71	
Pool Content EOM (1,000 AC. FT.)	2666.4	2655.3	2654.9	2742.0	3013.8	3030.4	3043.5	2929.0	2856.7	2774.8	2764.3	2752.1	

NORFORK LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflow (1,000 AC. FT.)													
Avg 1946 thru 1987	52.5	99.3	121.8	119.1	132.3	183.5	196.3	188.7	106.1	74.9	48.3	46.3	1368.3
WY 1987	49.7	47.8	53.0	68.5	162.6	167.6	118.6	92.5	73.0	59.1	37.5	31.4	961.3
Releases (1,000 AC. FT.)													
Avg 1946 thru 1987	67.0	64.0	99.8	130.6	121.1	71.7	135.8	68.2	110.5	120.0	109.9	84.5	1183.1
WY 1987	47.3	38.5	43.4	115.5	112.5	158.6	102.1	67.7	50.3	66.4	43.1	32.8	878.2
Basin Rainfall (inches)													
Avg 1946 thru 1987	3.1	3.8	3.1	2.4	2.7	3.6	4.1	4.9	4.0	3.5	3.0	3.4	41.6
WY 1987	4.8	2.4	1.7	2.0	4.3	3.4	2.0	4.6	3.5	4.3	2.5	2.2	37.7
Deviation	1.7	-1.4	-1.4	-.4	1.6	-.2	-2.1	-.3	-.5	.8	-.5	-1.2	-3.9
Pool Elevation													
End of Month	551.64	551.80	552.01	549.59	551.65	551.72	552.05	552.70	553.20	552.34	551.59	551.14	
Maximum	552.16	551.80	552.07	552.10	551.79	551.94	552.09	552.82	553.49	553.56	552.35	551.59	
Minimum	551.58	550.92	551.66	549.59	549.38	550.54	550.60	551.77	552.56	552.34	551.47	551.14	
Pool Content EOM (1,000 AC. FT.)	1243.3	1246.8	1251.4	1199.0	1243.5	1245.0	1252.3	1266.6	1277.7	1258.7	1242.2	1232.3	

WHITE RIVER BASIN

CLEARWATER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1,000 AC. FT.)													
Avg 1949 thru 1987	23.0	51.3	62.0	55.2	57.2	90.2	94.3	76.6	39.3	26.7	19.4	20.7	615.9
WY 1987	44.6	29.3	36.3	25.7	31.0	80.4	54.1	18.3	17.8	25.4	14.8	11.6	389.3
Releases (1,000 AC. FT.)													
Avg 1949 thru 1987	23.5	33.2	59.0	59.2	59.2	79.2	88.1	76.5	51.3	33.7	27.8	27.2	617.9
WY 1987	46.1	28.8	36.5	25.5	30.1	80.6	47.1	17.0	17.3	26.9	14.0	12.4	382.3
Basin Rainfall (inches)													
Avg 1949 thru 1987	3.0	4.1	3.4	2.5	2.7	4.0	4.4	4.6	3.8	3.7	3.5	3.4	43.1
WY 1987	4.7	2.2	1.8	1.2	3.1	3.4	1.9	1.8	3.6	6.2	3.4	1.8	35.1
Deviation	1.7	-1.9	-1.6	-1.3	.4	-.6	-2.5	-2.8	-.2	2.5	-.1	-1.6	-8.0
Pool Elevation													
End of Month	494.04	494.25	494.06	494.11	494.59	494.31	498.04	498.39	498.27	497.10	497.16	496.48	
Maximum	500.61	494.72	494.71	494.59	494.90	499.21	501.93	498.39	499.12	498.70	497.13	497.16	
Minimum	494.02	493.95	494.01	494.04	494.01	493.98	493.87	498.04	498.07	497.10	496.93	496.21	
Pool Content EOM													
(1,000 AC. FT.)	22.0	22.3	22.0	22.1	22.9	22.4	29.0	29.6	29.4	27.2	27.3	26.1	

GREERS FERRY LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1,000 AC. FT.)													
Avg 1965 thru 1987	47.9	111.5	185.1	105.4	138.2	145.6	223.9	166.1	55.5	10.6	8.1	26.7	1224.6
WY 1987	17.2	35.8	51.9	57.2	259.7	222.3	51.6	48.1	23.9	6.3	5.3	3.4	782.7
Releases (1,000 AC. FT.)													
Avg 1965 thru 1987	37.8	42.5	80.4	140.5	129.8	132.3	133.9	130.7	92.0	104.5	104.1	55.2	1183.7
WY 1987	12.0	14.4	6.5	31.5	113.9	293.1	67.0	30.5	31.1	33.7	24.8	13.9	672.4
Basin Rainfall (inches)													
Avg 1964 thru 1987	4.2	4.6	4.5	2.6	3.1	4.9	4.8	5.2	3.7	3.2	3.3	4.9	49.0
WY 1987	4.8	3.0	2.0	2.1	6.9	4.1	.8	4.9	3.0	3.1	3.1	3.5	41.3
Deviation	.6	-1.6	-2.5	-.5	3.8	-.8	-4.0	-.3	-.7	-.1	-.2	-1.4	-7.7
Pool Elevation													
End of Month	456.00	456.54	457.92	458.60	463.07	460.59	459.77	459.96	459.29	457.97	456.92	456.27	
Maximum	456.08	456.54	457.96	459.31	463.07	463.70	460.59	459.96	460.10	459.30	457.98	456.92	
Minimum	455.61	455.99	456.54	457.91	458.60	460.59	459.23	459.37	459.29	457.97	456.92	456.27	
Pool Content EOM													
(1,000 AC. FT.)	1757.0	1773.2	1814.6	1835.6	1976.2	1897.6	1871.9	1877.8	1857.0	1816.1	1784.6	1765.1	

PUEBLO RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1894 thru 1987	21.98	22.42	21.25	19.81	16.68	16.04	24.06	68.73	128.58	87.68	59.07	26.01	509.32
FY 1987	35.59	42.67	33.62	25.33	29.80	37.09	83.13	166.91	186.29	74.99	46.23	30.80	792.45
Releases (1000 Ac-Ft)													
Avg 1966 thru 1987	20.18	16.34	14.21	13.88	13.13	14.57	26.89	66.44	125.96	88.89	55.48	25.04	481.20
FY 1987	35.92	26.69	34.26	18.61	29.22	36.41	87.06	164.79	183.24	84.12	64.10	32.17	796.59
Rainfall (Inches)													
Avg 1938 thru 1987	.69	.36	.45	.31	.26	1.11	.97	1.91	1.41	1.83	2.20	.70	12.20
FY 1987	1.42	0.33	.52	.86	1.24	0.99	0.24	2.16	2.63	0.14	2.88	0.40	13.81
Pool Elevation (EOM)	4877.44	4880.75	4880.48	4881.79	4881.74	4881.61	4880.36	4880.47	4880.59	4877.85	4873.38	4872.65	
Maximum	4877.68	4880.75	4880.76	4881.79	4881.88	4881.79	4881.60	4880.60	4881.20	4880.53	4877.57	4873.37	
Minimum	4877.39	4877.26	4880.48	4880.49	4881.69	4881.60	4880.29	4880.22	4880.32	4877.85	4873.38	4872.65	
Pool Content (EOM) (1000 Ac-Ft)	250.65	265.77	264.51	270.63	270.40	269.79	263.96	264.47	265.02	252.49	232.87	229.78	

TRINIDAD LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1896 thru 1987	2.38	1.70	1.43	1.30	1.23	1.61	4.32	11.06	13.31	10.21	8.53	3.72	60.66
FY 1987	2.90	2.28	1.49	1.49	1.47	5.34	16.56	24.21	20.49	6.45	7.17	2.98	92.83
Releases (1000 Ac-Ft)													
Avg 1978 thru 1987	1.90	.49	.27	.20	.23	.21	2.15	9.43	14.11	12.87	10.21	9.57	61.64
FY 1987	.15	.33	.04	.03	.11	0	0	7.77	16.13	16.01	9.80	5.05	55.42
Rainfall (Inches)													
Avg 1978 thru 1987	1.15	1.10	.70	.58	.76	1.37	1.41	3.01	2.32	2.31	3.52	1.33	19.85
FY 1987	2.62	1.43	1.28	.74	1.78	2.23	.59	4.34	1.21	.48	4.93	.52	22.15
Pool Elevation (EOM)	6168.35	6171.78	6174.24	6176.75	6178.99	6186.67	6205.32	6219.58	6222.48	6213.88	6211.06	6208.74	
Maximum	6168.35	6171.97	6174.24	6176.75	6178.99	6186.67	6205.32	6219.58	6222.54	6222.45	6213.46	6211.10	
Minimum	6163.16	6168.52	6171.83	6174.31	6176.82	6179.09	6186.98	6205.90	6119.63	6113.88	6209.51	6208.60	
Pool Content (EOM) (1000 Ac-Ft)	14.49	16.33	17.71	19.17	20.54	25.74	41.95	57.92	61.59	51.12	47.96	45.47	

JOHN MARTIN RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1914 thru 1987	8.84	6.74	7.34	8.88	7.84	6.58	14.05	32.80	52.60	33.50	33.10	9.80	237.46
FY 1987	28.09	36.14	27.75	34.40	18.23	36.95	76.04	225.63	114.26	15.43	13.38	13.13	639.43
Release (1000 Ac-Ft)													
Avg 1956 thru 1987	10.85	1.42	.88	.37	.94	1.89	24.84	27.72	33.57	37.64	34.25	19.11	193.50
FY 1987	11.87	.31	.33	.33	.29	14.31	70.84	155.86	158.92	52.91	49.84	18.40	534.22
Rainfall (Inches)													
Avg 1943 thru 1987	.78	.41	.23	.22	.25	.60	1.01	2.12	1.47	1.95	1.81	.81	11.70
FY 1987	2.42	.84	.21	.12	1.74	.94	.23	4.09	1.95	.52	3.54	1.34	17.94
Pool Elevation (EOM)	3839.21	3842.96	3845.60	3848.71	3850.12	3851.70	3851.61	3856.74	3852.48	3848.23	3844.10	3843.08	
Maximum	3839.21	3842.96	3845.60	3848.71	3850.12	3851.78	3851.85	3856.79	3856.70	3852.30	3847.95	3844.05	
Minimum	3837.15	3839.40	3843.08	3845.64	3848.83	3850.14	3851.54	3851.50	3852.48	3848.23	3844.10	3843.08	
Pool Content (EOM) (1000 Ac-Ft)	225.95	260.42	286.44	319.45	335.19	353.47	352.41	416.08	362.72	314.21	271.45	261.57	

CHENEY RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1981	11.66	7.53	6.44	6.63	8.27	13.31	14.69	18.68	17.71	9.29	5.22	9.33	128.8
FY 1987	38.24	8.96	13.80	13.05	17.64	63.73	23.01	22.96	16.72	71.88	16.98	6.70	313.7
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	10.34	13.74	3.22	3.64	4.46	10.99	16.89	15.42	12.47	9.60	1.96	2.15	104.9
FY 1987	38.89	8.60	7.43	8.62	13.07	36.54	44.43	13.77	7.06	66.42	6.65	4.80	256.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.18	1.30	0.91	0.69	0.93	1.65	2.43	4.03	4.02	3.09	2.95	3.00	27.18
FY 1987	1.07	0.96	0.23	0.67	0.85	3.19	1.00	4.57	3.87	0.80	3.97	1.20	22.38
DEVIATION	-1.11	-0.34	-0.68	-0.02	-0.08	1.54	-1.43	0.54	-0.15	-2.29	1.02	-1.80	-4.80
POOL ELEVATION													
END OF MONTH	1422.05	1421.70	1421.84	1421.98	1422.16	1424.32	1421.62	1421.90	1422.18	1421.93	1422.10	1421.70	
MAXIMUM	1424.37	1422.49	1422.05	1422.10	1422.18	1424.96	1424.32	1422.28	1422.18	1426.97	1422.40	1422.10	
MINIMUM	1422.00	1421.60	1421.60	1421.59	1421.61	1421.60	1421.62	1421.62	1421.63	1421.93	1421.72	1421.54	
POOL CONTENT-EOM													
(1000AC.FT)	171.37	168.02	169.35	170.[illegible]	172.45	194.35	167.26	169.92	172.65	170.21	171.86	168.02	

ARKANSAS RIVER BASIN

ELDORADO	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1921 THRU 1978	5.00	4.40	2.80	2.70	2.80	6.20	10.20	11.80	14.40	7.40	3.40	5.50	76.6
FY 1987	43.07	1.18	10.22	6.68	19.25	31.16	11.82	10.06	5.63	3.30	11.46	1.58	155.4
RELEASES(1000AC.FT.)													
AVG 1983 THRU 1987	19.12	3.99	5.36	1.46	2.53	5.90	10.99	9.39	7.84	3.07	1.29	0.75	71.7
FY 1987	43.68	0.42	22.82	4.37	9.26	25.37	8.53	1.78	4.58	1.72	3.44	1.28	127.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.49	1.67	1.14	0.89	0.97	1.96	2.91	4.34	4.84	3.65	3.18	3.80	31.84
FY 1987	2.28	0.70	0.62	0.61	1.13	2.95	0.82	4.41	1.97	1.09	6.54	2.65	25.77
DEVIATION	-0.21	-0.97	-0.52	-0.28	0.16	0.99	-2.09	0.07	-2.87	-2.56	3.36	-1.15	-6.07
POOL ELEVATION													
END OF MONTH	1338.95	1338.87	1337.03	1337.20	1338.52	1338.94	1338.94	1339.53	1339.12	1338.66	1339.16	1338.75	
MAXIMUM	1343.58	1338.98	1339.66	1337.34	1338.52	1340.15	1339.85	1339.61	1339.53	1339.13	1339.50	1339.16	
MINIMUM	1338.95	1338.87	1337.02	1336.99	1336.96	1338.52	1338.93	1338.87	1339.04	1338.66	1338.51	1338.75	
POOL CONTENT-EOM (1000AC.FT)	156.60	155.97	141.78	143.07	153.22	156.52	156.52	161.31	157.97	154.32	158.30	155.03	

ARKANSAS RIVER BASIN

KAW LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	158.53	125.65	84.51	85.12	96.99	171.76	249.25	301.29	342.30	239.71	131.96	141.41	2128.5
FY 1987	1219.02	150.35	173.89	124.78	300.87	1013.55	351.67	575.31	307.24	482.38	313.09	125.75	5137.9
RELEASES(1000AC.FT.)													
AVG 1977 THRU 1987	213.22	162.38	100.88	97.52	103.43	288.17	341.90	247.78	349.44	254.63	87.14	101.13	2347.6
FY 1987	1165.19	309.73	158.93	186.15	176.58	941.22	532.89	199.67	585.56	570.84	257.34	133.16	5217.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.39	1.66	1.13	0.87	1.03	1.88	2.86	4.29	4.44	3.50	3.17	3.58	30.80
FY 1987	1.44	1.04	0.42	0.61	1.11	3.26	0.54	5.89	3.01	1.16	4.64	1.73	24.85
DEVIATION	-0.95	-0.62	-0.71	-0.26	0.08	1.38	-2.32	1.60	-1.43	-2.34	1.47	-1.85	-5.95
POOL ELEVATION													
END OF MONTH	1019.78	1011.80	1012.63	1008.95	1015.60	1019.52	1009.72	1026.98	1014.09	1008.47	1011.20	1010.43	
MAXIMUM	1045.51	1019.78	1013.25	1012.63	1015.60	1924.40	1019.52	1026.98	1027.00	1016.24	1011.36	1011.20	
MINIMUM	1017.27	1011.80	1011.26	1007.61	1007.57	1014.50	1008.78	1009.41	1014.09	1008.27	1008.23	1009.83	
POOL CONTENT-EOM (1000AC.FT)	619.20	460.14	475.23	410.98	531.88	613.53	423.90	791.49	502.44	403.16	449.46	436.04	

ARKANSAS RIVER BASIN

GREAT SALT PLAINS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	21.23	15.25	9.13	9.23	13.13	21.07	31.69	54.65	45.26	22.56	21.24	19.10	283.5
FY 1987	135.98	49.30	24.20	30.62	77.91	173.54	53.98	143.68	62.82	65.24	21.28	52.56	891.1
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	26.43	23.23	9.86	9.13	14.24	35.03	34.31	58.15	58.52	24.53	5.90	12.05	311.4
FY 1987	146.54	51.70	24.78	25.45	64.79	157.73	84.44	104.10	95.58	61.99	10.62	31.69	859.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.87	1.19	0.84	0.69	0.91	1.52	2.35	3.71	3.57	2.54	2.89	2.39	24.47
FY 1987	1.21	1.10	0.06	0.46	1.22	3.07	0.47	4.85	3.48	1.05	2.70	2.77	22.44
DEVIATION	-0.66	-0.09	-0.78	-0.23	0.31	1.55	-1.88	1.14	-0.09	-1.49	-0.19	0.38	-2.03
POOL ELEVATION													
END OF MONTH	1125.60	1125.57	1125.47	1125.85	1126.98	1128.36	1125.60	1128.91	1125.62	1125.19	1125.78	1127.47	
MAXIMUM	1129.43	1126.82	1125.70	1125.85	1127.29	1129.93	1128.36	1129.27	1128.91	1126.96	1125.98	1127.47	
MINIMUM	1125.60	1125.47	1125.45	1125.40	1125.48	1125.62	1125.60	1125.47	1125.49	1125.19	1124.83	1125.26	
POOL CONTENT-EOM													
(1000AC.FT)	36.99	36.71	35.78	39.31	50.97	67.63	36.99	74.80	37.17	33.18	38.66	56.71	

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ARKANSAS RIVER BASIN

KEYSTONE LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	394.68	288.16	175.45	167.90	194.73	336.81	536.34	752.88	738.79	466.47	283.50	328.51	4664.2
FY 1987	4400.73	1111.14	511.93	522.45	1027.64	2308.26	979.04	1406.48	1181.55	1086.15	317.55	362.38	15215.3
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	560.39	323.62	212.92	177.74	210.63	547.96	600.02	690.84	756.97	487.31	190.94	198.59	4957.9
FY 1987	4398.57	1235.61	617.68	502.98	894.93	2392.93	1079.74	795.86	1649.35	1151.75	322.12	376.23	15417.8
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.38	1.72	1.18	0.97	1.15	1.87	2.87	4.41	4.16	3.14	2.99	3.40	30.24
FY 1987	2.97	2.54	0.27	0.71	1.47	2.23	0.41	5.87	3.80	1.96	2.83	4.66	29.72
DEVIATION	0.59	0.82	-0.91	-0.26	0.32	0.36	-2.46	1.46	-0.36	-1.18	-0.16	1.26	-0.52
POOL ELEVATION													
END OF MONTH	732.55	728.51	724.71	725.97	730.53	727.27	722.92	741.71	727.48	724.38	723.60	722.67	
MAXIMUM	755.82	736.75	728.82	725.97	730.53	740.57	727.27	741.71	742.02	731.17	724.45	723.83	
MINIMUM	732.55	726.12	724.71	722.91	723.82	727.27	722.92	721.75	727.48	724.38	722.93	721.57	
POOL CONTENT-EOM													
(1000AC.FT)	825.55	702.07	599.43	631.88	762.04	667.07	555.75	1156.11	672.92	591.18	572.05	549.96	

ARKANSAS RIVER BASIN

HEYBURN LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1929 THRU 1981	2.44	2.65	1.50	1.30	1.92	3.24	6.15	7.82	7.59	2.51	1.53	3.77	42.4
FY 1987	17.38	8.97	4.71	8.40	24.34	11.99	2.07	9.75	2.70	4.75	0.13	0.33	95.5
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	4.13	2.75	2.42	2.31	4.99	6.54	4.56	10.80	6.03	0.73	0.05	0.57	45.9
FY 1987	21.03	8.70	4.91	7.36	15.60	21.19	1.96	7.04	4.69	4.48	0.01	0.00	97.0
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.84	2.27	1.49	1.43	1.54	2.33	3.51	4.95	4.32	3.12	2.98	3.99	34.77
FY 1987	5.16	3.33	1.16	2.10	3.08	3.63	1.04	5.56	3.58	5.38	3.04	3.51	40.57
DEVIATION	2.32	1.06	-0.33	0.67	1.54	1.30	-2.47	0.61	-0.74	2.26	0.06	-0.48	5.80
POOL ELEVATION													
END OF MONTH	761.88	762.27	761.80	762.81	769.45	762.15	761.79	764.09	761.76	761.61	761.14	761.15	
MAXIMUM	769.79	764.11	763.48	763.80	769.45	770.00	762.15	765.97	764.09	763.88	761.61	761.28	
MINIMUM	761.74	761.78	761.80	761.78	762.22	762.03	761.79	761.55	761.71	761.61	761.00	760.96	
POOL CONTENT-EOM (1000AC.FT)	7.45	7.81	7.38	8.33	16.95	7.70	7.37	9.70	7.34	7.21	6.80	6.81	

ARKANSAS RIVER BASIN

TORONTO LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	19.64	18.97	11.46	12.33	13.35	32.04	46.42	40.55	52.97	34.79	9.13	23.24	314.9
FY 1987	216.99	10.64	40.60	20.02	77.86	97.37	24.88	90.24	26.57	8.77	14.09	3.89	631.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	34.16	24.29	13.93	8.22	23.18	44.12	49.28	36.23	60.10	17.26	10.86	9.48	331.1
FY 1987	215.19	33.35	41.45	19.48	46.66	128.30	25.34	41.47	71.57	8.31	10.75	3.78	645.6
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.71	2.05	1.31	1.05	1.05	2.42	3.23	4.63	5.05	3.88	3.36	4.28	35.02
FY 1987	4.63	1.41	0.51	0.60	1.58	2.79	1.11	6.15	2.51	1.83	6.92	2.53	32.57
DEVIATION	1.92	-0.64	-0.80	-0.45	0.53	0.37	-2.12	1.52	-2.54	-2.05	3.56	-1.75	-2.45
POOL ELEVATION													
END OF MONTH	908.78	902.24	902.09	902.25	910.75	901.94	901.47	913.67	901.72	901.37	902.15	901.89	
MAXIMUM	931.43	908.78	906.61	902.92	910.75	918.41	904.24	914.47	913.67	902.78	903.15	902.15	
MINIMUM	908.49	901.50	901.63	901.36	901.77	901.94	901.42	901.42	901.53	901.37	901.30	901.50	
POOL CONTENT-EOM (1000AC.FT)	45.39	23.03	22.61	23.06	53.96	22.20	20.95	68.23	21.62	20.69	22.78	22.07	

ARKANSAS RIVER BASIN

FALL RIVER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	15.23	14.09	8.25	9.31	10.09	23.68	36.26	33.38	37.93	18.32	6.26	15.10	227.9
FY 1987	164.27	9.72	35.23	20.45	75.12	74.68	20.69	69.24	10.60	6.20	7.89	2.34	496.4
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	22.44	17.11	9.90	7.15	16.86	33.38	38.59	33.34	45.22	21.66	5.55	3.42	254.6
FY 1987	156.31	48.63	37.05	19.68	47.16	103.84	21.71	23.89	52.38	5.82	6.22	1.53	524.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.61	1.76	1.23	0.95	1.04	2.17	3.11	4.45	4.86	3.69	3.10	4.03	33.00
FY 1987	4.46	1.79	0.60	0.51	1.89	2.38	1.01	6.42	1.95	2.10	6.76	2.32	32.19
DEVIATION	1.85	0.03	-0.63	-0.44	0.85	0.21	-2.10	1.97	-2.91	-1.59	3.66	-1.71	-0.81
POOL ELEVATION													
END OF MONTH	959.80	948.95	949.04	949.33	957.60	948.85	948.45	960.80	949.02	948.60	948.72	948.76	
MAXIMUM	981.09	959.80	952.17	949.65	957.60	963.37	950.47	961.42	960.80	949.61	949.92	948.98	
MINIMUM	957.15	948.48	948.63	948.64	918.53	948.85	948.45	948.40	948.58	948.56	948.55	948.63	
POOL CONTENT-EOM (1000AC.FT)	61.48	22.98	23.20	23.94	51.94	22.75	21.81	66.06	23.15	22.16	22.44	22.54	

ARKANSAS RIVER BASIN

ELK CITY LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	18.46	17.90	8.53	10.18	9.80	25.74	41.73	40.68	42.54	21.54	5.05	14.88	257.0
FY 1987	359.62	46.83	39.15	30.54	86.43	81.22	14.32	89.00	3.66	8.71	5.14	1.27	765.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	43.54	21.70	12.87	13.80	17.70	41.37	32.39	36.98	51.43	50.83	10.27	6.22	339.1
FY 1987	410.68	59.23	49.73	32.05	70.46	103.54	14.52	27.32	56.91	6.52	3.47	0.61	835.0
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.81	2.22	1.35	1.23	1.17	2.33	3.45	4.71	5.10	3.63	3.15	4.33	35.48
FY 1987	4.36	3.40	0.70	1.12	2.85	2.69	1.44	8.22	1.17	3.45	5.08	1.84	36.32
DEVIATION	1.55	1.18	-0.65	-0.11	1.68	0.36	-2.01	3.51	-3.93	-0.18	1.93	-2.49	0.84
POOL ELEVATION													
END OF MONTH	800.12	798.12	796.26	795.83	799.09	794.27	793.86	805.15	794.05	794.22	794.20	794.05	
MAXIMUM	830.38	801.14	798.97	796.27	800.81	806.16	795.03	805.69	805.15	795.05	794.71	794.20	
MINIMUM	800.12	796.24	796.26	794.34	794.20	794.13	793.83	793.86	794.02	794.00	793.97	794.02	
POOL CONTENT-EOM (1000AC.FT)	65.17	54.73	45.94	44.03	59.67	37.50	35.87	95.84	36.60	37.29	37.21	36.60	

ARKANSAS RIVER BASIN

BIG HILL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1929 THRU 1978	1.69	1.19	0.75	1.05	0.67	1.69	2.30	3.13	3.60	1.73	0.27	1.33	19.4
FY 1987	14.97	4.00	0.77	1.80	6.47	1.76	0.59	3.20	0.08	0.94	0.56	0.22	35.4
RELEASES(1000AC.FT.)													
AVG 1984 THRU 1987	5.54	1.89	1.08	0.64	3.36	3.48	2.03	3.25	1.61	0.38	1.00	0.72	25.0
FY 1987	20.31	3.22	1.42	0.92	4.64	4.15	0.25	1.88	0.53	0.24	0.02	0.00	37.6
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.15	2.50	1.49	1.48	1.33	2.55	3.80	5.19	5.67	3.84	3.33	4.80	39.13
FY 1987	9.24	4.59	1.25	1.77	3.81	3.22	2.71	7.36	2.19	4.05	5.95	3.65	49.79
DEVIATION	6.09	2.09	-0.24	0.29	2.48	0.67	-1.09	2.17	-3.48	0.21	2.62	-1.15	10.66
POOL ELEVATION													
END OF MONTH	857.99	858.42	857.81	858.46	859.97	857.90	857.85	858.47	857.59	857.64	857.63	857.48	
MAXIMUM	869.19	859.80	858.60	858.67	859.97	859.97	858.07	859.28	858.47	858.20	857.88	857.65	
MINIMUM	857.98	857.84	857.81	857.80	858.03	857.90	857.74	857.74	857.57	857.58	857.48	857.46	
POOL CONTENT-EOM													
(1000AC.FT)	27.52	28.05	27.30	28.10	30.02	27.41	27.04	27.78	26.73	26.79	26.78	26.60	

ARKANSAS RIVER BASIN

OOLOGAH LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	152.90	138.22	80.40	91.90	84.20	179.83	276.30	289.73	290.68	163.74	51.80	107.14	1906.8
FY 1987	1839.67	468.99	285.82	203.21	565.03	672.99	145.98	336.00	264.99	62.18	35.63	21.97	4902.5
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	197.61	168.74	121.73	85.13	116.10	313.19	299.05	223.52	276.32	247.87	51.73	46.30	2147.3
FY 1987	1690.81	607.30	439.99	209.82	343.58	747.02	315.49	176.72	293.68	111.09	10.25	9.33	4955.1
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.14	2.42	1.51	1.45	1.33	2.58	3.70	5.03	5.22	3.61	3.31	4.59	37.89
FY 1987	5.40	3.47	0.59	1.21	2.65	2.55	1.35	5.25	1.80	3.11	4.56	2.68	34.62
DEVIATION	2.26	1.05	-0.92	-0.24	1.32	-0.03	-2.35	0.22	-3.42	-0.50	1.25	-1.91	-3.27
POOL ELEVATION													
END OF MONTH	647.90	644.39	639.39	638.97	645.45	642.93	637.01	641.65	640.20	637.94	638.00	637.93	
MAXIMUM	664.91	648.37	644.39	639.39	645.45	648.03	642.93	641.69	643.64	640.20	638.14	638.13	
MINIMUM	645.43	641.83	639.39	637.82	638.19	642.93	637.01	636.90	640.20	637.94	637.54	637.74	
POOL CONTENT-EOM													
(1000AC.FT)	892.34	760.81	595.45	582.60	799.07	709.89	524.96	667.16	620.51	551.69	553.42	551.41	

ARKANSAS RIVER BASIN

HULAH LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1918 THRU 1981	26.93	22.70	9.62	9.63	9.35	24.64	40.30	45.44	38.01	29.02	12.81	25.62	294.1
FY 1987	332.92	74.38	54.73	36.99	124.96	117.62	19.54	94.97	27.07	24.69	6.57	1.64	916.1
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	44.11	24.68	26.09	9.62	14.02	46.21	43.37	47.31	54.85	29.80	6.32	3.46	349.8
FY 1987	370.74	79.18	90.41	40.76	59.86	177.42	30.14	29.57	84.70	23.78	3.64	0.18	990.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.89	2.23	1.38	1.24	1.20	2.22	3.48	4.95	4.67	3.42	3.28	4.17	35.13
FY 1987	3.89	3.26	0.38	0.95	2.61	3.15	1.03	8.07	2.43	2.60	3.82	2.41	34.60
DEVIATION	1.00	1.03	-1.00	-0.29	1.41	0.93	-2.45	3.12	-2.24	-0.82	0.54	-1.76	-0.53
POOL ELEVATION													
END OF MONTH	743.69	743.30	736.26	735.27	746.90	736.17	733.02	745.46	733.67	733.15	733.10	732.88	
MAXIMUM	769.42	744.04	743.30	736.26	746.90	750.95	736.17	745.60	745.46	736.98	733.81	733.19	
MINIMUM	743.69	737.93	736.26	733.03	734.55	736.17	732.89	732.85	733.61	733.05	732.95	732.88	
POOL CONTENT-EOM (1000AC.FT)	82.52	80.09	43.93	39.82	104.42	43.54	31.23	94.19	33.62	31.71	31.52	30.74	

ARKANSAS RIVER BASIN

COPAN	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1936 THRU 1977	13.68	13.22	6.94	8.51	7.76	20.51	30.72	34.78	28.28	17.26	4.40	11.59	197.7
FY 1987	332.45	61.88	42.89	27.20	85.03	81.78	17.45	77.87	34.89	26.14	2.95	0.93	791.5
RELEASES(1000AC.FT.)													
AVG 1984 THRU 1987	103.76	36.00	46.02	15.85	19.20	74.57	60.56	48.11	66.90	31.05	2.99	8.51	513.5
FY 1987	347.66	82.16	74.22	21.17	57.16	102.54	27.60	20.74	85.58	22.65	1.26	0.48	843.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.04	2.28	1.39	1.33	1.23	2.41	3.51	4.83	4.96	3.44	3.14	3.90	35.46
FY 1987	4.13	3.64	0.49	1.05	2.62	2.55	1.53	6.51	1.96	2.56	3.94	2.52	33.50
DEVIATION	1.09	1.36	-0.90	-0.28	1.39	0.14	-1.98	1.68	-3.00	-0.88	0.80	-1.38	-1.96
POOL ELEVATION													
END OF MONTH	718.17	715.26	710.22	711.30	715.95	712.24	709.91	718.95	710.03	710.21	709.95	709.65	
MAXIMUM	735.35	718.17	715.26	711.31	715.95	719.80	712.80	718.95	719.43	712.65	710.20	709.95	
MINIMUM	718.17	711.20	710.22	709.91	710.65	712.24	709.07	709.83	709.89	710.03	709.88	709.64	
POOL CONTENT-EOM (1000AC.FT)	92.35	72.81	44.50	50.00	77.22	54.99	42.99	98.01	43.57	44.46	43.18	41.77	

ARKANSAS RIVER BASIN

BIRCH LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1936 THRU 1979	2.40	1.65	1.02	0.96	0.96	3.02	3.18	5.61	3.12	1.78	0.82	1.95	26.5
FY 1987	13.30	6.76	3.29	3.87	15.80	2.65	0.17	2.02	0.41	1.33	0.44	6.03	56.1
RELEASES(1000AC.FT.)													
AVG 1979 THRU 1987	4.09	2.06	1.38	1.38	2.30	5.16	2.94	5.83	4.16	1.07	0.23	0.26	30.9
FY 1987	31.12	4.87	5.27	3.61	8.47	9.88	0.12	0.12	0.99	0.18	0.18	0.53	65.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.78	2.16	1.43	1.27	1.33	2.43	3.31	5.00	4.52	3.16	3.29	4.25	34.93
FY 1987	5.04	4.02	0.50	1.33	3.80	2.16	0.64	4.61	2.36	2.86	4.21	6.19	37.72
DEVIATION	2.26	1.86	-0.93	0.06	2.47	-0.27	-2.67	-0.39	-2.16	-0.30	0.92	1.94	2.79
POOL ELEVATION													
END OF MONTH	750.82	752.25	750.57	750.68	756.50	750.54	750.13	751.36	750.37	750.85	750.53	754.64	
MAXIMUM	769.03	753.31	752.31	752.03	756.50	757.04	750.54	751.36	751.53	751.15	750.85	754.91	
MINIMUM	750.43	750.24	750.51	750.39	750.34	750.54	750.13	749.66	750.37	750.34	750.46	750.19	
POOL CONTENT-EOM													
(1000AC.FT)	19.55	21.22	19.26	19.39	26.59	19.23	18.77	20.17	19.04	19.58	19.22	24.16	

ARKANSAS RIVER BASIN

SKIATOOK LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1935 THRU 1978	13.47	8.09	3.91	3.61	4.29	12.59	15.35	28.43	16.19	10.64	4.09	12.37	133.0
FY 1987	88.94	34.06	13.72	24.17	73.92	32.63	4.08	22.51	3.41	9.57	2.03	25.21	334.3
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.88	2.21	1.41	1.32	1.36	2.37	3.30	4.83	4.38	3.24	3.25	4.19	34.74
FY 1987	4.63	3.77	0.66	1.26	3.18	2.71	0.79	5.86	3.40	3.40	4.16	6.90	40.72
DEVIATION	1.75	1.56	-0.75	-0.06	1.82	0.34	-2.51	1.03	-0.98	0.16	0.91	2.71	5.98
POOL ELEVATION													
END OF MONTH	700.52	693.73	691.06	694.63	702.84	698.67	698.00	700.26	698.03	698.00	697.78	700.79	
MAXIMUM	707.66	700.52	693.73	694.63	702.84	704.32	698.67	700.26	700.26	698.83	698.00	700.79	
MINIMUM	699.45	691.28	691.04	691.06	694.63	698.67	697.94	697.90	697.98	698.00	697.65	697.63	
POOL CONTENT-EOM													
(1000AC.FT)	207.11	157.26	139.68	163.45	225.97	192.79	182.81	199.61	183.03	182.81	181.25	203.68	

ARKANSAS RIVER BASIN

NEWT GRAHAM LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1957	306.03	159.47	104.65	137.73	123.85	203.04	501.27	562.13	549.77	233.60	99.67	137.64	3118.9
FY 1987	3102.25	1035.43	725.35	415.06	725.75	1327.54	443.70	358.81	550.31	265.68	54.05	69.27	9073.2
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	370.48	309.33	235.69	171.09	261.36	532.69	514.64	525.99	514.58	347.98	88.95	88.54	3961.3
FY 1987	3088.34	1034.18	725.36	415.27	725.10	1326.64	440.61	359.68	548.49	264.98	53.20	68.01	9049.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.12	2.36	1.54	1.46	1.47	2.53	3.61	4.88	4.73	3.28	3.20	4.32	36.50
FY 1987	4.32	3.56	0.53	1.21	2.84	2.27	0.83	5.19	2.68	2.91	3.97	4.05	34.36
DEVIATION	1.20	1.20	-1.01	-0.25	1.37	-0.26	-2.78	0.31	-2.05	-0.37	0.77	-0.27	-2.14
POOL ELEVATION													
END OF MONTH	531.46	532.23	532.18	531.99	532.81	532.65	532.77	531.80	532.50	532.43	532.47	532.99	
MAXIMUM	535.99	533.64	733.09	532.81	532.89	532.81	533.96	533.21	532.79	532.92	533.00	533.13	
MINIMUM	526.30	531.16	531.35	531.00	531.38	531.19	531.28	531.28	531.30	531.13	532.20	530.81	
POOL CONTENT-EOM													
(1000AC.FT)	22.75	23.89	23.82	23.53	24.78	24.53	24.72	23.25	24.30	24.20	24.26	25.05	

ARKANSAS RIVER BASIN

CHOUTEAU LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1957	306.03	159.47	104.65	137.73	123.85	203.31	501.22	562.13	549.77	233.60	99.67	137.64	3119.1
FY 1987	2953.88	1069.19	761.65	455.40	780.89	1439.31	480.99	377.06	613.68	287.21	57.42	73.88	9350.6
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	363.90	313.25	238.03	168.56	263.36	536.26	523.54	527.67	529.48	336.08	82.86	82.50	3965.5
FY 1987	2953.63	1068.62	761.90	454.72	780.61	1439.37	479.81	376.16	612.78	286.02	56.39	72.84	9342.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.40	2.83	2.00	1.90	1.99	2.91	4.15	5.22	5.06	3.06	2.93	4.16	39.61
FY 1987	9.14	3.49	1.00	2.56	3.35	2.79	0.50	6.25	2.27	4.14	5.99	4.12	45.60
DEVIATION	5.74	0.66	-1.00	0.66	1.36	-0.12	-3.65	1.03	-2.79	1.08	3.06	-0.04	5.99
POOL ELEVATION													
END OF MONTH	511.30	511.43	511.21	511.42	511.49	511.40	511.47	511.45	511.33	511.34	511.37	511.49	
MAXIMUM	519.30	511.56	511.56	511.81	511.58	511.72	511.57	511.57	511.65	511.85	511.56	511.59	
MINIMUM	510.16	511.09	511.18	511.08	511.14	510.78	511.14	511.12	511.14	511.05	511.13	511.04	
POOL CONTENT-EOM													
(1000AC.FT)	23.05	23.36	22.84	23.33	23.50	23.28	23.45	23.40	23.12	23.14	23.21	23.50	

ARKANSAS RIVER BASIN

COUNCIL GROVE LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	5.97	4.43	2.97	2.79	3.75	7.35	10.32	12.52	16.44	12.31	5.02	7.52	91.4
FY 1987	18.48	4.24	6.35	5.09	12.92	35.00	16.25	8.88	6.82	3.02	3.95	0.95	122.0
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	7.15	4.25	3.94	1.59	4.17	11.31	12.10	12.35	14.87	13.50	1.97	3.31	90.5
FY 1987	23.47	3.97	5.33	3.73	7.55	37.48	17.59	7.27	6.37	2.40	1.12	0.63	116.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.59	1.63	1.19	0.86	0.91	1.99	3.10	4.60	4.92	3.83	3.54	3.86	33.02
FY 1987	1.77	0.94	0.48	0.73	1.04	4.11	1.23	4.05	3.55	0.91	6.35	2.00	27.16
DEVIATION	-0.82	-0.69	-0.71	-0.13	0.13	2.12	-1.87	-0.55	-1.37	-2.92	2.81	-1.86	-5.86
POOL ELEVATION													
END OF MONTH	1274.27	1274.15	1274.29	1274.56	1275.98	1275.03	1274.26	1274.39	1274.14	1273.84	1274.19	1273.97	
MAXIMUM	1280.18	1274.27	1274.79	1274.56	1275.98	1278.29	1276.94	1275.77	1275.17	1274.37	1274.38	1274.19	
MINIMUM	1274.25	1274.00	1273.99	1274.02	1273.97	1273.93	1274.03	1274.01	1274.01	1273.84	1273.37	1273.87	
POOL CONTENT-EOM (1000AC.FT)	49.40	49.00	49.47	50.36	55.19	51.92	49.37	49.80	48.97	47.99	49.13	48.41	

ARKANSAS RIVER BASIN

MARION LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1971	3.16	1.28	1.49	1.94	2.08	3.31	5.91	8.70	10.17	7.13	1.78	4.79	51.7
FY 1987	4.38	1.73	7.38	3.00	9.06	33.32	7.10	14.22	8.50	3.10	11.07	0.82	103.7
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	3.56	4.18	3.21	1.83	2.76	5.54	8.17	8.63	7.11	8.93	2.30	1.67	57.9
FY 1987	3.09	3.83	18.70	0.26	3.58	22.72	8.86	7.59	8.22	3.90	1.35	2.77	84.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.50	1.57	1.07	0.80	0.96	1.88	2.75	4.45	4.68	3.82	3.26	3.73	31.47
FY 1987	1.22	0.27	0.58	0.58	0.79	4.46	0.76	4.75	3.36	0.89	8.47	0.70	26.83
DEVIATION	-1.28	-1.30	-0.49	-0.22	-0.17	2.58	-1.99	0.30	-1.32	-2.93	5.21	-3.03	-4.64
POOL ELEVATION													
END OF MONTH	1351.02	1350.52	1348.46	1348.84	1349.60	1351.04	1350.34	1351.05	1350.66	1349.96	1350.98	1350.25	
MAXIMUM	1351.36	1351.02	1350.65	1348.84	1349.60	1352.89	1351.04	1351.76	1351.05	1350.94	1351.13	1350.98	
MINIMUM	1350.90	1350.49	1348.46	1348.46	1348.76	1349.60	1350.34	1350.34	1350.38	1349.96	1349.70	1350.25	
POOL CONTENT-EOM (1000AC.FT)	86.97	83.87	71.68	73.83	78.28	87.10	82.75	87.17	84.74	80.41	86.72	82.19	

ARKANSAS RIVER BASIN

JOHN REDMOND DAM AND RES	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	71.02	55.44	38.04	36.84	40.33	87.60	126.29	136.01	165.24	118.01	39.59	70.27	984.7
FY 1987	419.42	39.16	68.33	55.43	119.59	477.23	166.28	98.31	91.12	107.96	78.29	37.07	1758.2
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	87.60	77.54	48.43	26.47	60.11	134.12	164.72	149.41	176.56	142.27	38.30	42.77	1148.3
FY 1987	462.87	110.78	92.16	47.41	108.77	448.01	207.43	52.34	126.46	104.06	58.15	46.85	1865.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.63	1.69	1.18	0.90	0.96	2.06	2.99	4.44	4.89	3.82	3.40	4.04	33.00
FY 1987	1.52	0.64	0.32	0.40	1.01	3.44	0.84	3.66	3.35	1.22	6.58	2.36	25.34
DEVIATION	-1.11	-1.05	-0.86	-0.50	0.05	1.38	-2.15	-0.78	-1.54	-2.60	3.18	-1.68	-7.66
POOL ELEVATION													
END OF MONTH	1047.81	1042.09	1039.27	1040.01	1040.92	1043.22	1038.96	1043.05	1039.28	1039.13	1040.89	1039.58	
MAXIMUM	1063.97	1047.81	1042.31	1040.01	1040.92	1051.07	1043.22	1043.05	1044.08	1043.08	1041.07	1040.89	
MINIMUM	1047.81	1040.90	1039.27	1038.89	1038.99	1039.22	1038.83	1038.96	1039.01	1039.06	1038.79	1039.07	
POOL CONTENT-EOM (1000AC.FT)	175.86	102.39	73.83	80.82	89.94	115.24	70.93	113.22	73.93	72.51	89.64	76.76	

ARKANSAS RIVER BASIN

PENSACOLA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	322.60	323.22	236.46	249.34	281.52	462.47	648.79	692.47	729.00	403.86	171.64	260.79	4782.2
FY 1987	3246.64	640.76	374.08	416.33	1016.83	1532.53	511.93	596.43	315.67	287.90	153.92	96.79	9189.8
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	433.98	436.25	350.76	249.99	370.51	655.68	713.14	524.01	539.16	469.21	221.99	200.96	5165.6
FY 1987	3204.20	727.31	562.87	359.07	775.04	1606.74	666.35	428.41	442.85	278.42	141.58	142.63	9335.5
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.39	2.71	1.89	1.73	1.73	2.91	4.02	5.15	5.26	3.58	3.39	4.64	40.40
FY 1987	4.41	2.32	0.41	0.94	2.30	2.82	1.18	4.58	2.50	2.23	4.19	2.22	30.10
DEVIATION	1.02	-0.39	-1.48	-0.79	0.57	-0.09	-2.84	-0.57	-2.76	-1.35	0.80	-2.42	-10.30
POOL ELEVATION													
END OF MONTH	747.57	745.61	741.31	742.53	747.57	745.78	742.05	745.37	742.34	742.00	741.73	740.34	
MAXIMUM	754.97	747.57	745.61	742.53	748.62	749.37	745.88	745.37	745.37	742.41	742.34	741.73	
MINIMUM	747.00	743.78	741.31	740.92	741.90	745.78	742.05	740.51	742.34	741.95	741.73	740.34	
POOL CONTENT-EOM (1000AC.FT)	1794.93	1700.67	1507.33	1560.32	1794.93	1708.66	1539.20	1689.39	1551.96	1537.00	1525.39	1466.28	

ARKANSAS RIVER BASIN

LAKE HUDSON	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	366.07	326.50	276.23	277.65	316.68	493.77	703.76	798.60	797.85	469.55	232.23	292.51	5351.4
FY 1987	3390.64	823.44	613.88	452.33	914.18	1816.96	729.32	501.82	483.07	287.21	142.61	139.74	10295.2
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	469.48	500.08	411.47	295.03	428.28	764.95	874.02	620.29	662.63	498.57	225.92	215.35	5966.1
FY 1987	3413.67	887.56	618.64	455.60	874.79	1833.97	745.27	492.08	476.23	279.85	135.45	139.36	10352.5
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.78	3.02	2.17	1.94	2.08	3.16	4.26	5.47	5.21	3.23	3.42	4.66	42.40
FY 1987	4.01	2.17	0.31	1.21	1.72	2.65	0.88	3.84	1.75	2.61	3.90	3.22	28.27
DEVIATION	0.23	-0.85	-1.86	-0.73	-0.36	-0.51	-3.38	-1.63	-3.46	-0.62	0.48	-1.44	-14.13
POOL ELEVATION													
END OF MONTH	624.18	619.03	619.15	618.74	622.05	620.32	618.51	619.00	619.17	619.28	619.39	619.12	
MAXIMUM	635.93	624.18	619.58	619.58	624.28	625.52	620.32	619.53	620.00	620.02	619.64	619.44	
MINIMUM	622.71	618.91	618.96	618.74	618.58	620.32	618.31	618.51	618.40	618.49	618.76	618.83	
POOL CONTENT-EOM (1000AC.FT)	261.41	200.63	201.96	197.51	235.10	214.99	195.05	200.30	202.18	203.39	204.61	201.63	

ARKANSAS RIVER BASIN

FORT GIBSON LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1980	392.66	377.51	305.41	312.54	355.69	546.77	797.48	887.79	880.74	507.86	248.96	323.89	5937.3
FY 1987	3784.07	918.05	623.11	516.69	973.79	1966.81	769.78	528.69	491.70	306.25	135.27	146.68	11160.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	535.84	521.59	471.42	323.36	391.71	854.95	953.81	672.50	684.64	548.07	219.28	206.75	6383.9
FY 1987	4066.78	1084.41	630.60	494.90	875.66	2003.42	834.56	424.34	580.14	317.54	93.83	150.22	11556.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.63	2.96	2.16	1.97	2.13	3.14	4.26	5.40	5.12	3.05	3.21	4.39	41.42
FY 1987	5.55	2.34	0.42	1.79	1.70	2.53	0.63	4.20	1.91	2.39	4.83	3.81	32.10
DEVIATION	1.92	-0.62	-1.74	-0.18	-0.43	-0.61	-3.63	-1.20	-3.21	-0.66	1.62	-0.58	-9.32
POOL ELEVATION													
END OF MONTH	562.15	554.55	554.15	555.17	559.60	557.71	554.17	558.80	554.15	552.99	554.64	554.14	
MAXIMUM	582.02	562.15	556.00	555.52	559.60	568.34	558.04	558.91	558.80	555.35	555.02	554.76	
MINIMUM	562.15	553.61	554.08	553.51	553.50	556.44	553.67	552.96	553.56	552.76	552.98	553.65	
POOL CONTENT-EOM (1000AC.FT)	545.48	375.81	368.09	387.90	483.32	440.74	368.48	464.92	368.09	346.32	377.55	367.90	

ARKANSAS RIVER BASIN

WEBBERS FALLS L&D	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1940 THRU 1981	1163.75	1067.84	732.82	668.85	751.95	1291.80	1905.47	2350.06	1996.12	1593.36	687.71	627.23	14837.0
FY 1987	12311.80	4108.07	2196.10	1577.06	3030.54	6969.72	2588.83	1682.38	3200.93	1761.92	481.78	553.39	40462.5
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	1605.72	1334.90	1013.41	733.78	972.14	2224.67	2321.47	2127.68	2240.10	1428.31	501.15	495.12	16998.5
FY 1987	12322.41	4091.53	2194.11	1583.51	3028.85	6968.66	2589.60	1672.02	3198.23	1757.37	470.80	543.71	40420.8
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.41	2.83	2.08	1.91	2.12	2.97	4.26	5.28	5.09	3.01	2.94	4.21	40.11
FY 1987	7.47	3.34	0.79	1.95	2.47	2.55	0.44	4.45	2.21	2.32	3.65	3.12	34.76
DEVIATION	4.06	0.51	-1.29	0.04	0.35	-0.42	-3.82	-0.83	-2.88	-0.69	0.71	-1.09	-5.35
POOL ELEVATION													
END OF MONTH	489.34	490.57	490.62	489.95	489.93	489.72	489.23	489.66	489.37	489.18	489.52	490.04	
MAXIMUM	491.45	491.19	490.91	490.62	490.59	490.52	490.53	490.66	490.62	490.59	490.30	490.55	
MINIMUM	485.06	489.01	489.94	488.19	489.51	489.11	488.46	487.65	488.24	488.28	487.81	488.85	
POOL CONTENT-EOM (1000AC.FT)	162.60	177.02	177.63	169.54	169.31	166.92	161.35	166.24	162.94	160.78	164.65	170.59	

ARKANSAS RIVER BASIN

TENKILLER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	52.66	73.08	76.11	82.05	97.10	136.73	174.34	188.34	119.59	53.49	40.27	35.47	1129.2
FY 1987	531.17	95.80	45.92	134.58	129.72	283.83	116.03	73.88	50.28	26.98	17.35	27.37	1532.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	65.36	56.45	86.68	77.43	52.28	100.38	147.36	101.99	78.18	55.64	42.82	28.23	892.8
FY 1987	445.45	207.34	67.02	144.87	88.79	266.46	173.98	49.26	57.05	33.28	18.55	16.07	1568.1
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.62	3.17	2.58	2.22	2.66	3.52	4.59	5.65	4.89	3.15	3.29	4.32	43.66
FY 1987	6.58	2.57	0.24	1.92	1.91	3.05	1.40	3.46	1.59	1.51	3.69	3.63	31.55
DEVIATION	2.96	-0.60	-2.34	-0.30	-0.75	-0.47	-3.19	-2.19	-3.30	-1.64	0.40	-0.69	-12.11
POOL ELEVATION													
END OF MONTH	642.47	634.58	632.90	632.02	635.04	636.07	631.31	632.84	631.94	631.02	630.42	631.03	
MAXIMUM	665.25	642.47	634.58	633.17	635.04	640.63	636.07	632.84	632.95	632.10	631.03	631.45	
MINIMUM	636.69	634.58	632.83	631.98	631.81	635.04	631.31	630.85	631.67	631.02	630.36	630.35	
POOL CONTENT-EOM (1000AC.FT)	798.81	687.90	665.89	654.36	693.94	707.87	645.06	665.10	653.31	641.26	633.86	641.39	

CONCHAS LAKE

ARKANSAS RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1940 thru 1987	9.87	3.85	3.67	3.80	4.17	4.31	15.91	29.54	24.30	23.99	27.94	21.02	172.37
FY 1987	9.86	21.90	9.85	8.81	21.08	33.68	65.54	82.11	25.86	8.90	22.92	7.56	318.07
Releases (1000 Ac-Ft)													
Avg 1941 thru 1987	8.24	1.89	1.64	.66	1.07	2.41	14.72	18.59	15.76	17.80	18.18	20.14	121.10
FY 1987	5.97	0	0	.02	8.17	37.74	60.36	78.64	20.50	22.18	9.14	8.09	247.81
Rainfall (Inches)													
Avg 1940 thru 1987	1.10	.51	.45	.34	.41	.62	.85	1.62	1.62	2.35	2.43	1.31	13.55
FY 1987	1.94	3.67	.60	.69	1.50	.25	.61	4.00	1.86	.37	5.68	.93	22.10
Pool Elevation (EOM)	4196.52	4198.74	4199.64	4200.39	4201.48	4200.94	4201.01	4200.93	4201.01	4198.88	4199.86	4199.44	
Maximum	4196.52	4198.74	4199.64	4200.39	4201.50	4201.52	4101.17	4201.10	4201.13	4201.15	4199.86	4199.92	
Minimum	4195.67	4196.56	4198.76	4199.66	4200.44	4200.89	4200.93	4200.93	4200.91	4198.88	4198.30	419[C44	
Pool Content (EOM) (1000 Ac-Ft)	289.01	308.81	317.15	324.25	334.80	329.54	330.22	329.45	330.22	310.09	319.22	315.28	

SANFORD RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	21.36	3.42	1.97	3.18	2.09	2.58	11.47	35.88	38.51	37.66	35.93	30.86	224.9
FY 1987	8.04	18.50	4.45	4.58	7.12	8.85	14.23	56.75	29.23	14.07	16.71	13.64	196.2
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.32	0.60	0.49	0.45	0.48	0.68	1.14	2.52	2.36	2.68	2.48	1.62	16.82
FY 1987	0.92	1.28	0.22	0.21	0.49	0.54	0.24	3.08	1.99	0.37	1.51	0.91	11.76
DEVIATION	-0.40	0.68	-0.27	-0.24	0.01	-0.14	-0.90	0.56	-0.37	-2.31	-0.97	-0.71	-5.06
POOL ELEVATION													
END OF MONTH	2889.52	2891.07	2890.95	2890.92	2891.05	2891.20	2891.58	2896.67	2898.52	2898.34	2898.56	2899.04	
MAXIMUM	2889.58	2891.15	2891.08	2890.96	2891.06	2891.27	2891.58	2896.67	2898.52	2898.72	2898.56	2899.11	
MINIMUM	2889.34	2889.50	2890.95	2890.82	2890.92	2891.05	2891.01	2891.58	2896.67	2898.34	2897.89	2898.46	
POOL CONTENT-EOM													
(1000AC.FT)	262.16	275.03	274.02	273.77	274.86	276.14	279.36	324.54	341.90	340.19	342.28	346.85	

ARKANSAS RIVER BASIN

NORMAN RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1961	3.80	0.90	1.60	1.10	2.10	4.20	9.50	13.70	12.10	4.40	0.70	2.40	56.5
FY 1987	33.43	20.65	7.77	14.56	20.63	18.14	5.50	27.66	5.71	6.78	0.23	3.97	165.0
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	4.24	4.85	1.57	2.90	2.11	5.45	4.30	4.48	7.33	1.67	0.00	0.00	38.9
FY 1987	31.32	14.97	11.61	9.70	15.74	21.81	2.66	0.88	21.63	3.88	0.00	0.00	134.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.89	2.07	1.51	1.32	1.54	2.23	3.48	5.50	5.35	2.90	2.60	3.48	34.87
FY 1987	4.91	4.79	1.01	2.74	3.27	2.70	0.81	5.34	4.37	2.65	1.92	5.49	40.00
DEVIATION	2.02	2.72	-0.50	1.42	1.73	0.47	-2.67	-0.16	-0.98	-0.25	-0.68	2.01	5.13
POOL ELEVATION													
END OF MONTH	1039.50	1040.21	1039.19	1039.62	1040.12	1039.08	1038.96	1042.46	1039.36	1039.03	1038.16	1038.21	
MAXIMUM	1043.23	1040.55	1040.21	1039.90	1040.12	1040.67	1039.43	1042.54	1042.46	1040.00	1039.03	1038.25	
MINIMUM	1039.50	1038.96	1039.04	1039.00	1038.95	1038.98	1038.95	1038.52	1039.20	1039.03	1038.16	1038.01	
POOL CONTENT-EOM (1000AC.FT)	122.65	127.06	120.76	123.38	126.48	120.09	119.36	142.02	121.80	119.78	114.56	114.86	

ARKANSAS RIVER BASIN

OPTIMA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1939 THRU 1981	2.10	0.82	0.96	0.89	1.05	1.05	1.57	5.60	6.75	3.77	3.36	3.30	31.2
FY 1987	0.04	0.23	0.10	0.02	0.06	0.26	0.23	0.21	0.10	0.00	0.11	0.07	1.4
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.13	0.59	0.40	0.37	0.42	0.77	1.23	2.64	2.25	2.69	2.41	1.62	16.52
FY 1987	0.53	0.40	0.09	0.11	0.16	0.42	0.16	2.39	1.11	0.46	1.07	1.26	8.16
DEVIATION	-0.60	-0.19	-0.31	-0.26	-0.26	-0.35	-1.07	-0.25	-1.14	-2.23	-1.34	-0.36	-8.36
POOL ELEVATION													
END OF MONTH	2714.70	2715.00	2715.00	2714.95	2715.00	2715.25	2715.20	2715.15	2714.80	2713.90	2713.55	2713.35	
MAXIMUM	2714.90	2715.20	2715.00	2715.00	2715.00	2715.25	2715.35	2715.35	2715.15	2714.80	2713.90	2713.55	
MINIMUM	2714.70	2714.65	2715.00	2714.95	2714.95	2715.00	2715.20	2715.15	2714.65	2713.90	2713.55	2713.35	
POOL CONTENT-EOM (1000AC.FT)	1.32	1.43	1.43	1.41	1.43	1.55	1.52	1.50	1.36	1.03	0.92	0.86	

ARKANSAS RIVER BASIN

FORT SUPPLY LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	5.96	3.34	1.83	1.92	3.26	3.01	4.63	12.05	11.42	4.28	3.50	3.59	58.8
FY 1987	2.78	5.03	4.13	4.31	5.30	12.16	5.93	9.62	4.05	4.85	2.28	5.71	66.2
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	1.47	1.12	1.10	1.51	2.05	2.74	2.87	8.59	3.89	0.82	0.51	0.54	27.2
FY 1987	2.22	4.14	3.81	4.66	5.42	9.02	6.62	4.38	7.68	3.73	1.19	2.40	55.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.60	0.94	0.67	0.57	0.80	1.13	1.73	3.66	3.06	2.44	2.45	1.82	20.87
FY 1987	0.74	1.73	0.11	0.36	0.47	2.90	1.03	2.61	2.81	1.23	3.37	2.32	19.68
DEVIATION	-0.86	0.79	-0.56	-0.21	-0.33	1.77	-0.70	-1.05	-0.25	-1.21	0.92	0.50	-1.19
POOL ELEVATION													
END OF MONTH	2003.99	2004.20	2004.24	2004.06	2003.91	2005.09	2004.25	2006.42	2004.07	2003.98	2003.88	2005.19	
MAXIMUM	2004.30	2004.58	2004.38	2004.28	2004.33	2005.71	2005.09	2006.42	2006.47	2004.71	2004.38	2005.23	
MINIMUM	2003.94	2003.73	2003.93	2003.97	2003.87	2003.84	2003.51	2003.96	2004.01	2003.67	2003.87	2003.88	
POOL CONTENT-EOM													
(1000AC.FT)	13.87	14.28	14.36	14.01	13.73	16.01	14.38	18.82	14.02	13.85	13.67	16.22	

ARKANSAS RIVER BASIN

CANTON LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	18.09	5.83	3.94	4.22	5.63	8.35	13.59	34.74	36.74	27.60	9.76	11.25	179.7
FY 1987	32.09	22.66	11.85	13.77	19.32	42.27	35.17	40.89	29.56	15.95	2.74	9.16	275.4
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	2.87	5.01	5.46	3.31	2.92	5.63	11.61	4.99	14.58	5.84	5.71	6.16	74.1
FY 1987	0.11	17.11	12.67	11.78	17.46	32.64	43.24	10.12	50.78	14.16	0.02	0.00	210.1
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.46	0.91	0.60	0.54	0.71	1.13	1.64	3.37	2.80	2.56	2.49	1.79	20.00
FY 1987	1.30	1.81	0.21	0.35	0.59	2.29	0.46	3.32	3.12	1.04	1.57	2.32	18.38
DEVIATION	-0.16	0.90	-0.39	-0.19	-0.12	1.16	-1.18	-0.05	0.32	-1.52	-0.92	0.53	-1.62
POOL ELEVATION													
END OF MONTH	1614.85	1615.56	1615.40	1615.60	1615.70	1616.60	1615.31	1618.53	1615.47	1615.16	1614.95	1615.72	
MAXIMUM	1614.85	1616.35	1615.62	1615.73	1615.75	1616.81	1616.62	1618.53	1618.61	1618.80	1615.16	1615.72	
MINIMUM	1610.51	1614.85	1615.39	1615.35	1615.34	1615.46	1615.30	1615.26	1615.43	1615.01	1614.87	1614.92	
POOL CONTENT-EOM													
(1000AC.FT)	107.03	112.62	111.35	112.94	113.73	121.08	110.64	137.79	111.91	109.45	107.80	113.89	

ARKANSAS RIVER BASIN

ARCADIA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1982	1.91	1.63	0.96	1.36	1.39	2.43	3.60	7.60	5.08	2.06	1.03	1.99	28.1
FY 1987	9.18	6.04	2.38	4.13	10.88	5.16	1.27	24.81	10.56	11.46	2.42	4.91	93.2
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.74	1.93	1.47	1.24	1.45	2.16	3.22	5.32	4.25	2.77	2.55	3.38	32.48
FY 1987	5.95	5.01	1.00	2.14	4.51	2.57	0.54	8.90	6.12	2.59	2.43	4.38	46.14
DEVIATION	3.21	3.08	-0.47	0.90	3.06	0.41	-2.68	3.58	1.87	-0.18	-0.12	1.00	13.66
POOL ELEVATION													
END OF MONTH	963.30	987.35	990.56	994.77	1001.70	999.07	997.93	1011.88	1008.55	997.97	998.14	998.69	
MAXIMUM	983.00	987.35	990.56	994.77	1001.70	1002.48	999.07	1011.88	1013.06	1010.59	998.70	999.28	
MINIMUM	957.80	963.30	987.35	990.56	994.77	999.07	997.90	997.92	1007.83	997.91	997.91	998.03	
POOL CONTENT-EOM													
(1000AC.FT)	0.08	5.13	7.43	11.34	20.36	16.54	15.03	39.51	32.45	15.08	15.30	16.03	

ARKANSAS RIVER BASIN

EUFAULA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	332.38	246.54	202.92	218.39	262.49	353.60	526.38	766.88	603.75	252.71	144.26	212.12	4122.4
FY 1987	1499.21	632.43	318.74	626.08	966.15	1344.60	215.01	929.85	676.96	290.88	110.08	99.37	7709.3
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	161.29	263.55	203.04	238.89	208.61	392.35	332.99	509.83	583.72	256.71	151.37	63.72	3366.1
FY 1987	744.32	845.07	487.10	559.53	602.26	1575.00	354.53	246.23	1071.26	395.44	101.53	71.38	7053.7
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.15	2.45	1.89	1.64	1.98	2.72	3.85	5.54	4.42	3.03	2.80	3.90	37.37
FY 1987	4.59	3.89	0.43	1.60	2.58	2.07	0.55	4.97	4.46	2.06	3.36	4.14	34.70
DEVIATION	1.44	1.44	-1.46	-0.04	0.60	-0.65	-3.30	-0.57	0.04	-0.97	0.56	0.24	-2.67
POOL ELEVATION													
END OF MONTH	589.28	587.11	585.38	585.85	588.69	586.42	584.70	590.34	586.54	585.09	584.64	584.57	
MAXIMUM	592.78	589.28	587.14	587.21	588.69	590.76	586.42	590.76	590.35	586.86	585.09	584.71	
MINIMUM	584.49	586.37	585.36	585.30	585.13	586.42	584.70	584.03	586.51	585.09	584.26	584.35	
POOL CONTENT-EOM													
(1000AC.FT)	2797.61	2545.34	2355.35	2405.78	2727.85	2468.45	2283.43	2925.31	2481.76	2324.23	2277.20	2269.94	

ARKANSAS RIVER BASIN

R.S.KERR LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1943 THRU 1981	1283.00	1231.74	1064.24	964.67	1176.02	1963.52	2466.04	3141.04	2757.85	2170.09	986.93	1279.80	20484.9
FY 1987	14103.77	5306.78	2804.43	2485.09	3818.58	8649.32	3063.67	2002.81	4412.63	2279.80	624.59	675.57	50227.0
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	1910.50	1719.17	1392.27	1111.50	1295.02	2803.93	2925.09	2907.58	2988.33	1708.78	690.45	581.72	22034.3
FY 1987	14106.49	5285.10	2817.55	2460.17	3806.50	8734.33	3024.03	1981.22	4362.54	2246.43	602.20	681.97	50108.5
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.60	3.07	2.57	2.13	2.61	3.43	4.54	5.61	4.69	3.16	3.15	4.19	42.75
FY 1987	5.61	3.34	1.01	2.82	2.87	3.13	1.47	6.33	2.01	1.95	3.61	3.80	37.95
DEVIATION	2.01	0.27	-1.56	0.69	0.26	-0.30	-3.07	0.72	-2.68	-1.21	0.46	-0.39	-4.80
POOL ELEVATION													
END OF MONTH	460.05	460.38	459.93	460.32	460.43	458.21	459.11	459.16	459.80	460.02	460.10	459.68	
MAXIMUM	460.61	460.67	460.54	460.72	460.50	460.57	460.88	460.30	460.69	460.61	460.27	460.31	
MINIMUM	457.19	458.46	459.32	459.20	459.10	458.19	458.21	458.50	458.82	459.80	459.03	458.65	
POOL CONTENT-EOM (1000AC.FT)	527.94	542.83	522.67	540.13	545.09	449.74	487.33	489.48	517.07	526.59	530.20	511.90	

ARKANSAS RIVER BASIN

W.D. MAYO LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1943 THRU 1981	1286.93	1308.95	1072.34	1000.13	1200.22	2018.50	2575.19	3157.14	2710.16	2122.46	974.74	1253.55	20680.3
FY 1987	14613.02	5344.66	2819.50	2517.02	3772.96	8855.80	3168.79	1973.55	4404.69	2263.93	596.43	676.96	51007.3
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	1994.75	1753.10	1436.94	1163.44	1338.82	2883.85	2947.90	2863.36	3056.16	1746.38	729.72	611.43	22525.8
FY 1987	14609.04	5346.76	2819.01	2518.04	3768.95	8856.25	3160.15	1975.17	4402.07	2263.21	596.33	676.22	50991.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.39	3.32	2.71	2.24	2.80	3.65	4.46	5.53	4.32	3.16	2.99	4.09	42.66
FY 1987	2.82	2.68	1.08	2.82	2.33	3.48	2.27	6.58	2.62	1.69	3.11	3.42	34.90
DEVIATION	-0.57	-0.64	-1.63	0.58	-0.47	-0.17	-2.19	1.05	-1.70	-1.47	0.12	-0.67	-7.76
POOL ELEVATION													
END OF MONTH	414.62	412.43	412.58	412.02	414.41	411.44	412.79	411.41	412.71	412.68	412.23	412.41	
MAXIMUM	427.60	414.62	413.15	413.26	415.11	416.00	413.15	413.50	413.16	413.25	413.15	413.14	
MINIMUM	412.45	411.37	411.91	411.98	411.13	410.95	411.35	411.00	411.11	411.93	411.81	411.89	
POOL CONTENT-EOM (1000AC.FT)	18.47	14.86	15.10	14.21	18.10	13.39	15.44	13.35	15.31	15.26	14.55	14.83	

WISTER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1981	18.76	50.47	65.96	67.53	93.38	126.43	132.44	134.46	60.21	21.41	9.21	17.46	797.7
FY 1987	5.75	13.41	20.92	51.67	57.12	151.73	26.38	79.34	24.50	3.27	4.96	5.26	444.3
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	19.00	40.19	109.35	62.50	74.51	116.89	82.97	110.96	99.05	17.23	5.02	3.32	741.0
FY 1987	0.74	6.33	44.26	50.77	34.25	162.89	33.84	11.88	61.16	6.87	2.16	1.16	416.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.43	3.56	3.15	2.71	3.16	4.00	4.65	5.87	4.08	3.55	3.28	4.16	45.60
FY 1987	2.55	2.42	1.28	1.76	1.66	2.91	0.44	4.11	2.41	1.20	2.27	2.23	25.24
DEVIATION	-0.88	-1.14	-1.87	-0.95	-1.50	-1.09	-4.21	-1.76	-1.67	-2.35	-1.01	-1.93	-20.36
POOL ELEVATION													
END OF MONTH	477.97	478.51	474.65	474.70	478.16	476.22	474.56	483.04	478.59	477.64	477.58	477.84	
MAXIMUM	477.99	478.61	478.54	477.49	478.16	485.45	476.22	483.04	483.04	478.60	477.64	477.84	
MINIMUM	477.41	477.96	474.64	474.62	474.59	476.22	474.49	474.52	478.10	477.64	477.40	477.46	
POOL CONTENT-EOM													
(1000AC.FT)	62.15	66.25	41.38	41.65	63.58	50.41	40.90	106.92	66.86	59.84	59.42	61.24	

JAMES W. TRIMBLE L & D	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1971 thru 1987	2037.0	2537.7	2109.2	1662.3	1799.9	3549.6	3329.2	3361.5	3431.7	1665.5	722.7	747.9	26954.2
WY 1987	13663.0	5281.3	2907.4	2627.7	3852.2	9105.5	3509.5	2112.1	4520.1	2269.5	616.4	720.9	51185.6
Project Rainfall (inches)													
Avg 1972 thru 1987	4.1	4.8	2.6	1.8	2.6	4.3	3.1	4.6	3.8	3.2	2.7	3.5	41.1
WY 1987	5.5	3.1	1.6	3.5	3.2	3.6	.7	1.0	1.7	4.3	4.6	.8	33.6
Deviation	1.4	-1.7	-1.0	1.7	.6	-.7	-2.4	-3.6	-2.1	1.1	1.9	-2.7	-7.5
Pool Elevation													
End of Month	390.21	392.21	391.97	391.80	389.63	388.95	391.96	389.19	391.92	392.02	391.55	391.44	
Maximum	401.82	392.21	392.21	392.20	391.90	391.98	392.25	392.89	391.96	392.06	392.44	392.36	
Minimum	388.76	388.52	389.90	389.73	389.03	388.74	388.95	389.12	389.07	391.29	391.21	390.52	
Pool Content EOM (1,000 AC. FT.)	47.7	60.6	58.9	57.8	44.4	40.8	58.8	42.0	58.6	59.2	56.1	55.4	

OZARK-JETA TAYLOR LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1972 thru 1987	2101.7	2822.7	2451.6	1776.4	2000.6	4000.4	3760.7	3671.6	3646.4	1746.0	762.4	776.7	29517.2
WY 1987	14330.9	5551.9	3029.8	2874.2	4201.4	9201.6	3512.6	1964.5	4484.5	2328.0	658.9	752.9	52891.2
Project Rainfall (inches)													
Avg 1973 thru 1987	4.2	5.1	3.5	2.0	2.9	4.6	3.4	5.3	4.3	3.1	2.6	3.7	44.7
WY 1987	5.3	2.7	1.9	2.8	4.4	4.3	.6	5.5	6.0	2.7	2.6	3.2	42.0
Deviation	1.1	-2.4	-1.6	.8	1.5	-.3	-2.8	.2	1.7	-.4	.0	-.5	-2.7
Pool Elevation													
End of Month	371.62	371.98	371.31	372.32	370.05	370.04	372.38	372.19	372.27	371.16	371.09	370.68	
Maximum	372.50	372.15	372.08	372.42	372.32	370.88	372.62	372.65	372.64	372.73	372.36	372.46	
Minimum	369.82	371.24	370.57	370.62	370.00	369.83	370.04	371.34	371.20	370.66	370.23	368.01	
Pool Content EOM (1,000 AC. FT.)	144.7	148.2	141.7	152.1	129.5	129.4	152.8	150.6	151.6	140.3	139.6	135.6	

DARDANELLE LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1966 thru 1987	1872.5	2412.0	2239.2	1727.9	1939.3	3391.7	3492.3	3571.3	3715.6	1674.3	835.7	801.9	27673.7
WY 1987	13270.5	5737.3	3010.8	2820.9	3990.9	9839.7	3750.8	2046.0	4883.8	2310.1	627.5	710.3	52998.6
Project Rainfall (inches)													
Avg 1971 thru 1987	4.7	5.0	4.6	2.4	3.2	4.9	4.0	5.7	4.3	2.5	2.9	3.8	48.0
WY 1987	5.8	3.1	2.9	2.4	5.2	2.9	.8	3.5	6.7	5.2	2.1	3.5	44.1
Deviation	1.1	-1.9	-1.7	.0	2.0	-2.0	-3.2	-2.2	2.4	2.7	-.8	-.3	-3.9
Pool Elevation													
End of Month	337.92	338.00	337.52	337.73	338.08	337.64	338.03	337.98	338.24	338.18	338.21	337.77	
Maximum	338.07	338.18	338.36	338.38	338.19	338.16	338.44	338.18	338.31	338.45	338.30	338.28	
Minimum	335.30	337.48	337.36	337.18	337.54	337.45	337.64	337.15	337.66	337.64	337.58	337.15	
Pool Content EOM													
(1,000 AC. FT.)	483.5	486.2	470.1	477.2	489.0	474.1	487.3	485.5	496.6	492.5	493.6	478.5	

BLUE MOUNTAIN LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflow (1,000 AC. FT.)	12.0	26.8	34.5	41.9	46.2	63.8	55.0	55.2	16.8	10.1	4.9	4.7	369.9
Avg 1948 thru 1987	1.9	7.5	13.7	25.7	44.6	90.6	11.6	35.1	11.9	.8	.3	.9	244.6
WY 1987													
Releases (1,000 AC. FT.)													
Avg 1948 thru 1987	5.7	14.9	36.3	37.6	42.9	49.9	44.5	51.5	36.2	17.3	11.2	6.3	354.3
WY 1987	1.8	6.9	14.1	25.4	31.9	73.2	30.1	13.9	31.7	3.1	1.0	2.2	235.3
Basin Rainfall (inches)													
Avg 1948 thru 1987	3.6	3.7	3.4	2.5	3.0	4.0	4.2	5.4	3.6	3.9	3.3	3.5	44.1
WY 1987	5.0	3.8	2.0	2.7	4.2	4.8	.5	7.1	3.4	3.4	2.5	3.3	42.7
Deviation	1.4	.1	-1.4	.2	1.2	.8	-3.7	1.7	-.2	-.5	-.8	-.2	-1.4
Pool Elevation													
End of Month	384.20	384.32	384.16	384.17	388.03	392.33	387.17	392.47	386.93	385.87	385.24	384.58	
Maximum	384.40	384.14	385.69	386.34	388.62	396.87	392.33	392.47	392.53	386.93	385.87	385.24	
Minimum	384.19	384.12	384.13	384.16	384.16	384.27	387.17	387.15	386.83	385.87	385.24	384.52	
Pool Content EOM													
(1,000 AC. FT.)	25.3	25.6	25.1	25.2	37.6	54.2	34.7	54.9	33.9	30.4	28.4	26.4	

ARTHUR V. ORMOND L & D	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1987	2159.2	2843.4	2971.4	1950.9	2106.6	3939.6	3941.3	3870.0	3667.8	1708.3	793.2	846.2	30797.9
WY 1987	13631.1	5861.2	3425.9	3231.2	4359.3	10096.0	3941.7	1855.4	4759.6	2193.4	612.4	678.2	54645.4
Project Rainfall (inches)													
Avg 1971 thru 1987	4.1	4.9	4.4	2.4	2.9	4.3	3.9	5.0	4.3	2.3	3.0	3.6	45.1
WY 1987	5.1	3.7	3.1	2.6	5.9	2.2	1.4	4.8	4.1	2.2	3.1	3.6	41.8
Deviation	1.0	-1.2	-1.3	.2	3.0	-2.1	-2.5	-.2	-.2	-.1	.1	.0	-3.3
Pool Elevation													
End of Month	284.11	286.36	285.44	286.77	284.14	284.41	286.69	285.42	284.42	285.71	284.51	285.84	
Maximum	297.64	286.36	287.07	286.77	286.78	289.09	286.69	287.14	285.79	286.27	286.35	286.53	
Minimum	282.79	284.01	284.27	284.13	284.08	283.91	283.96	284.47	284.15	284.40	284.25	284.06	
Pool Content EOM (1,000 AC. FT.)	49.4	61.1	56.2	63.3	49.5	50.9	62.9	56.1	50.9	57.6	51.4	58.3	

TOAD SUCK FERRY L & D	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1987	2080.7	2890.5	2773.5	2113.7	2255.9	4194.8	4133.6	3986.4	3742.5	2159.4	797.3	861.9	31990.2
WY 1987	12988.2	5727.2	3412.7	3104.9	4493.7	10307.6	3986.7	1813.3	4858.8	2087.6	640.4	712.5	54133.6
Project Rainfall (inches)													
Avg 1971 thru 1987	4.2	5.4	4.6	2.5	3.2	4.5	4.4	5.2	4.6	2.3	2.7	3.5	47.1
WY 1987	6.2	3.9	3.7	2.3	6.7	2.2	1.6	4.2	5.7	2.4	2.4	3.9	45.2
Deviation	2.0	-1.5	-.9	-.2	3.5	-2.3	-2.8	-1.0	1.1	.1	-.3	.4	-1.9
Pool Elevation													
End of Month	269.15	265.38	265.02	265.09	266.81	269.61	265.35	267.04	264.87	265.74	265.30	265.49	
Maximum	279.48	269.15	265.42	265.95	266.81	272.89	269.61	267.04	267.90	265.78	265.75	265.79	
Minimum	263.80	264.38	264.62	264.14	264.03	266.81	264.03	264.33	264.42	264.76	264.98	264.81	
Pool Content EOM (1,000 AC. FT.)	60.1	34.6	33.1	33.4	45.1	63.5	34.5	47.1	32.5	36.2	34.3	35.1	

WISTER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflow (1,000 AC. FT.)													
Avg 1964 thru 1987	19.4	39.8	68.4	64.6	86.8	103.3	89.9	95.3	37.4	12.6	6.8	6.9	630.4
WY 1987	7.6	22.3	51.0	51.0	67.5	146.7	20.9	33.8	12.2	.1	.1	.1	413.3
Releases (1,000 AC. FT.)													
Avg 1964 thru 1987	9.8	30.3	67.3	64.7	75.5	96.4	95.0	95.6	51.6	24.1	10.7	9.2	630.2
WY 1987	3.8	24.3	50.6	51.6	46.1	81.5	92.7	16.5	28.0	1.3	.9	2.3	399.6
Basin Rainfall (inches)													
Avg 1964 thru 1987	3.8	3.9	3.8	3.0	3.5	4.9	4.7	5.9	4.1	4.0	3.2	3.7	48.5
WY 1987	4.3	4.0	2.9	2.5	4.7	5.0	.6	7.2	2.3	3.3	3.6	3.5	43.9
Deviation	.5	.1	-.9	-.5	1.2	.1	-4.1	1.3	-1.8	-.7	.4	-.2	-4.6
Pool Elevation													
End of Month	343.03	342.42	342.48	342.20	346.97	356.12	345.07	348.13	344.73	343.87	343.01	342.11	
Maximum	343.40	344.35	346.95	344.18	346.97	357.27	356.12	348.13	349.73	344.73	343.87	343.01	
Minimum	342.02	341.75	341.98	341.59	342.08	345.13	345.05	344.89	344.63	343.87	342.99	342.11	
Pool Content EOM (1,000 AC. FT.)	32.7	30.5	30.7	29.7	50.8	114.8	41.4	57.3	39.9	36.2	32.6	29.4	

MURRAY LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1987	2201.0	2925.2	3055.2	2204.3	2355.5	4347.1	4344.9	4327.6	3840.2	1708.3	752.2	838.8	32900.3
WY 1987	13050.4	5947.1	3550.1	3173.7	4572.3	10169.9	4248.7	1893.2	4992.1	2247.3	607.9	704.6	55157.3
Project Rainfall (inches)													
Avg 1971 thru 1987	3.9	5.2	4.2	2.7	3.1	4.2	5.0	5.3	3.8	2.4	2.5	3.5	45.8
WY 1987	6.4	5.6	3.4	1.0	7.0	3.2	.6	2.8	4.5	2.3	2.8	5.9	45.5
Deviation	2.5	.4	-.8	-1.7	3.9	-1.0	-4.4	-2.5	.7	-.1	.3	2.4	-.3
Pool Elevation													
End of Month	247.18	248.83	249.30	249.06	248.07	247.14	250.32	247.91	249.18	250.16	250.47	250.30	
Maximum	253.40	249.33	249.37	249.68	249.30	248.07	250.32	250.84	249.38	250.39	250.74	250.70	
Minimum	246.06	246.95	248.05	248.12	247.10	246.81	247.06	247.91	247.02	247.48	249.48	249.60	
Pool Content EOM (1,000 AC. FT.)	71.1	85.6	90.2	87.7	78.6	70.8	101.0	77.2	89.0	99.2	102.6	100.7	

DAVID D. TERRY L & D	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1969 thru 1987	2096.8	2802.7	3133.6	2388.5	2550.1	4405.5	4438.0	4367.5	3914.8	1822.0	797.6	844.8	33561.9
WY 1987	13124.1	5977.7	3434.0	3081.5	4353.3	10417.4	4152.3	1842.0	4941.7	2276.9	619.6	731.2	54951.7
Project Rainfall (inches)													
Avg 1971 thru 1987	4.4	4.9	4.3	3.3	3.1	4.3	4.8	5.3	4.0	3.0	2.4	3.2	47.8
WY 1987	5.1	5.2	3.2	1.4	6.1	3.1	.3	3.8	1.8	.6	1.6	6.0	38.2
Deviation	.7	.3	-1.1	-1.9	3.0	-1.2	-4.5	-1.5	-2.2	-2.4	-.8	2.8	-8.8
Pool Elevation													
End of Month	229.41	230.58	231.13	230.95	230.58	229.25	231.13	229.92	231.11	231.19	231.19	231.16	
Maximum	230.52	231.26	231.59	231.73	231.02	232.04	231.45	231.45	231.37	231.44	231.78	231.88	
Minimum	229.05	229.22	230.15	230.03	229.90	228.89	228.98	229.88	229.78	230.59	230.79	230.85	
Pool Content EOM													
(1,000 AC. FT.)	43.1	47.9	50.1	49.3	47.9	42.4	50.1	45.3	50.0	50.4	50.4	50.2	

LOCK AND DAM NO. 5	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1987	2214.0	2959.7	3049.4	2296.8	2328.3	4377.8	4430.2	4318.0	3916.6	1782.8	796.7	883.5	33353.8
WY 1987	13153.4	5894.6	3773.6	3464.4	4737.4	10142.6	4082.1	1806.5	4882.0	2206.3	578.4	716.2	55437.5
Project Rainfall (inches)													
Avg 1972 thru 1987	4.5	4.9	4.9	3.0	3.5	4.4	4.9	5.7	3.7	3.1	2.7	3.6	48.9
WY 1987	6.7	7.0	3.3	2.4	6.7	1.6	.2	1.5	2.5	.4	6.2	2.1	40.6
Deviation	2.2	2.1	-1.6	-.6	3.2	-2.8	-4.7	-4.2	-1.2	-2.7	3.5	-1.5	-8.3
Pool Elevation													
End of Month	211.35	212.49	213.10	212.87	211.89	211.20	213.05	211.75	213.11	213.64	213.67	213.63	
Maximum	218.59	213.27	213.23	213.36	212.99	213.17	213.39	213.59	213.41	213.88	214.17	213.95	
Minimum	211.17	211.17	212.27	212.17	211.01	210.81	211.12	211.75	211.54	213.00	213.48	213.35	
Pool Content EOM													
(1,000 AC. FT.)	51.1	58.0	62.0	60.5	54.3	50.3	61.7	53.5	62.1	65.9	66.1	65.8	

LOCK AND DAM NO. 4	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1987	2226.5	3017.4	3109.2	2342.9	4161.2	4503.4	4641.7	4479.3	4058.9	1802.7	786.8	875.4	36005.4
WY 1987	13282.7	6092.3	3610.2	3254.6	4729.5	10075.8	4340.6	1995.7	5072.2	2316.1	648.7	728.1	56146.5
Project Rainfall (inches)													
Avg 1972 thru 1987	4.3	4.8	5.1	3.5	3.7	4.5	4.4	5.7	3.5	3.4	2.8	4.0	49.7
WY 1987	5.4	9.7	4.6	1.5	7.5	3.2	1.1	1.4	3.2	1.5	1.1	2.5	42.7
Deviation	1.1	4.9	-.5	-2.0	3.8	-1.3	-3.3	-4.3	-.3	-1.9	-1.7	-1.5	-7.0
Pool Elevation													
End of Month	194.31	196.01	196.39	196.03	195.26	194.52	196.25	195.26	195.94	196.37	195.99	196.21	
Maximum	201.51	196.30	196.39	196.39	196.04	196.98	196.33	196.51	196.31	196.37	196.53	196.96	
Minimum	194.12	194.16	195.45	195.31	194.65	194.12	194.22	194.99	194.84	195.49	195.59	195.81	
Pool Content EOM (1,000 AC. FT.)	61.2	70.5	73.0	70.6	66.4	62.4	72.1	66.4	70.1	72.8	70.3	71.8	

LOCK AND DAM NO. 3	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1987	2243.4	3048.7	3163.3	2352.2	2511.3	4549.6	4741.5	4614.2	4115.1	1811.1	767.3	864.3	34782.0
WY 1987	13318.0	6330.7	3810.7	3249.2	4847.4	10268.4	4445.8	1980.2	5130.1	2300.7	655.8	735.3	57072.3
Project Rainfall (inches)													
Avg 1971 thru 1987	4.2	4.6	4.6	3.6	3.4	4.4	4.3	5.2	3.7	3.0	3.1	3.5	47.6
WY 1987	4.2	10.4	6.6	2.0	6.1	2.9	1.0	3.0	2.4	2.0	2.9	4.2	47.7
Deviation	.0	5.8	2.0	-1.6	2.7	-1.5	-3.3	-2.2	-1.3	-1.0	-.2	.7	.1
Pool Elevation													
End of Month	182.44	181.85	182.36	182.13	181.28	182.69	182.28	182.01	182.21	182.37	182.42	182.26	
Maximum	189.40	182.44	182.41	182.52	182.27	184.58	182.49	182.46	182.29	182.82	182.59	182.66	
Minimum	180.90	180.50	181.24	181.30	180.90	181.28	180.36	181.52	180.66	181.76	181.64	181.79	
Pool Content EOM (1,000 AC. FT.)	48.2	45.8	47.8	46.9	43.6	48.4	47.5	46.4	47.2	47.9	48.1	47.4	

WILBUR D. MILLS DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1987	2133.3	3089.2	3372.3	2419.3	2588.5	4702.7	4890.8	4290.3	4120.1	1812.0	780.3	1416.5	35615.3
WY 1987	11480.0	6650.7	4018.5	3324.9	4755.8	10494.4	4447.2	1913.7	5070.6	2252.6	679.4	753.1	55840.9
Project Rainfall (inches)													
Avg 1971 thru 1987	4.7	5.6	5.3	4.4	4.4	6.1	4.8	5.3	3.9	3.1	3.1	3.7	54.4
WY 1987	5.2	9.7	7.1	2.8	8.3	3.4	1.1	3.6	1.8	2.1	1.4	3.5	50.0
Deviation	.5	4.1	1.8	-1.6	3.9	-2.7	-3.7	-1.7	-2.1	-1.0	-1.7	-.2	-4.4
Pool Elevation													
End of Month	161.54	162.41	162.19	161.96	161.67	161.57	163.19	161.26	162.45	162.23	162.27	162.13	
Maximum	162.74	162.80	162.91	162.29	161.98	161.91	163.19	163.41	162.46	162.50	162.68	162.41	
Minimum	157.04	161.37	161.54	161.33	161.12	160.85	161.04	161.15	161.11	161.81	162.00	161.80	
Pool Content EOM (1,000 AC. FT.)	105.2	114.7	112.2	109.7	106.6	105.5	123.5	102.2	115.1	112.7	113.1	111.5	

MORREL LOCK NO. 1 (No basic data collected)

RED RIVER BASIN

ALTUS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1981	7.13	2.75	3.44	3.77	5.05	5.93	9.57	29.65	20.95	8.39	3.01	3.01	102.7
FY 1987	98.68	41.00	19.91	20.44	31.06	42.13	15.90	53.19	23.04	15.92	4.60	10.08	375.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	0.24	3.46	1.58	1.63	2.29	4.15	1.46	17.82	6.74	8.36	5.69	0.42	53.8
FY 1987	2.34	40.66	18.33	19.58	26.02	43.72	12.52	34.82	23.71	11.28	0.33	0.00	233.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.99	0.88	0.77	0.63	0.83	1.19	1.99	4.09	3.19	2.21	2.50	2.30	22.57
FY 1987	2.00	1.89	0.05	0.10	0.75	1.35	0.08	3.58	1.96	1.09	1.86	2.06	16.77
DEVIATION	0.01	1.01	-0.72	-0.53	-0.08	0.16	-1.91	-0.51	-1.23	-1.12	-0.64	-0.24	-5.80
POOL ELEVATION													
END OF MONTH	1559.35	1559.16	1559.15	1559.12	1559.73	1559.06	1559.10	1559.96	1559.30	1559.24	1554.81	1555.43	
MAXIMUM	1559.35	1560.66	1559.26	1559.24	1559.76	1559.73	1559.23	1561.37	1559.96	1559.67	1559.24	1555.43	
MINIMUM	1538.40	1559.02	1558.99	1559.05	1559.02	1558.99	1559.00	1557.97	1559.00	1559.24	1554.81	1554.13	
POOL CONTENT-EOM (1000AC.FT)	135.05	133.85	133.78	133.59	137.47	133.21	133.47	138.93	134.74	134.36	108.21	111.66	

MOUNTAIN PARK DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1981	1.51	0.45	0.36	0.25	0.33	0.66	1.38	5.73	4.07	1.28	0.73	1.77	18.5
FY 1987	25.12	5.74	1.68	4.86	10.69	4.03	1.43	52.05	5.29	2.22	2.19	0.98	116.3
RELEASES(1000AC.FT.)													
AVG 1981 THRU 1987	1.30	3.06	0.80	0.00	1.56	0.68	0.03	3.52	3.37	0.63	0.00	0.00	15.0
FY 1987	7.62	14.86	5.61	0.00	10.95	4.54	0.00	24.42	22.38	0.52	0.00	0.00	90.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.49	1.35	1.14	1.03	1.18	1.55	2.43	4.82	3.37	2.15	2.26	2.87	26.64
FY 1987	5.29	2.64	0.43	0.90	2.81	1.48	0.03	13.54	4.77	2.77	2.66	3.23	40.55
DEVIATION	2.80	1.29	-0.71	-0.13	1.63	-0.07	-2.40	8.72	1.40	0.62	0.40	0.36	13.91
POOL ELEVATION													
END OF MONTH	1413.37	1411.72	1410.99	1411.56	1411.36	1410.95	1410.66	1414.22	1411.12	1410.67	1410.31	1409.97	
MAXIMUM	1413.72	1413.49	1411.72	1411.56	1412.12	1411.36	1410.95	1415.82	1414.22	1411.14	1410.67	1410.31	
MINIMUM	1410.96	1411.72	1410.98	1410.97	1411.02	1410.90	1410.66	1410.03	1410.93	1410.67	1410.31	1409.97	
POOL CONTENT-EOM													
(1000AC.FT)	104.86	93.67	88.91	92.62	91.32	88.66	86.84	110.87	89.75	86.90	84.64	82.52	

RED RIVER BASIN

LAKE KEMP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1924 THRU 1981	22.20	5.94	6.74	3.73	5.59	7.68	12.78	38.02	25.28	15.57	18.91	27.01	189.4
FY 1987	95.43	22.44	8.47	9.38	20.20	20.46	10.91	97.90	38.65	17.61	8.35	5.59	355.4
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	7.87	8.55	2.41	2.11	1.81	5.73	3.91	4.58	13.82	15.78	12.78	9.94	89.3
FY 1987	47.84	62.30	12.45	9.21	15.68	22.40	4.25	8.85	89.63	22.02	12.16	5.13	311.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.41	1.08	0.98	0.83	1.00	1.10	1.88	3.66	2.73	1.99	2.22	2.92	22.80
FY 1987	1.81	2.44	0.45	0.48	1.20	0.53	0.03	6.36	1.60	0.52	1.46	0.87	17.75
DEVIATION	-0.60	1.36	-0.53	-0.35	0.20	-0.57	-1.85	2.70	-1.13	-1.47	-0.76	-2.05	-5.05
POOL ELEVATION													
END OF MONTH	1147.42	1144.89	1144.45	1144.35	1144.50	1144.08	1144.01	1148.73	1145.19	1144.11	1143.17	1142.75	
MAXIMUM	1148.21	1147.47	1144.90	1144.63	1144.94	1144.65	1144.19	1148.73	1149.46	1145.19	1144.13	1143.22	
MINIMUM	1144.90	1144.42	1144.34	1144.18	1144.04	1144.01	1143.96	1143.27	1145.19	1144.11	1143.15	1142.75	
POOL CONTENT-EOM													
(1000AC.FT)	325.17	282.15	275.15	273.56	275.95	269.27	268.16	349.00	287.05	269.75	255.38	249.15	

WAURIKA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1925 THRU 1981	7.81	4.14	3.26	1.71	3.76	5.22	7.51	26.25	17.73	3.32	1.70	4.28	86.7
FY 1987	85.23	39.27	17.55	26.95	52.96	37.59	9.02	173.10	27.93	14.78	4.29	4.38	493.1
RELEASES(1000AC.FT.)													
AVG 1983 THRU 1987	20.82	29.26	7.44	14.34	9.82	34.07	10.66	15.79	40.72	8.55	0.15	2.37	194.0
FY 1987	59.14	51.13	23.44	24.66	31.20	55.04	3.89	6.07	147.49	41.25	0.25	0.24	443.8
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.92	1.79	1.47	1.30	1.47	1.94	0.00	5.21	3.61	2.31	2.36	3.26	27.64
FY 1987	5.55	3.54	0.51	1.46	2.42	1.75	0.21	8.33	3.56	1.04	1.46	3.56	33.39
DEVIATION	2.63	1.75	-0.96	0.16	0.95	-0.19	0.21	3.12	-0.05	-1.27	-0.90	0.30	5.75
POOL ELEVATION													
END OF MONTH	953.45	952.24	951.56	951.62	953.45	951.53	951.51	963.95	954.58	951.52	951.16	951.05	
MAXIMUM	955.13	953.84	952.28	952.20	953.45	954.45	951.89	964.14	963.95	954.58	951.59	951.50	
MINIMUM	951.35	951.51	951.45	951.49	951.45	951.53	951.49	951.36	954.58	951.48	951.07	950.86	
POOL CONTENT-EOM													
(1000AC.FT)	225.44	211.96	204.72	205.35	225.44	204.41	204.20	365.54	238.44	204.31	200.56	199.42	

RED RIVER BASIN

FOSS RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1980	3.53	1.79	1.23	1.31	1.79	2.86	9.34	15.36	12.37	3.69	3.11	2.87	59.3
FY 1987	26.04	25.77	4.32	6.41	12.50	22.10	9.34	30.98	16.58	6.24	0.33	5.64	166.2
RELEASES(1000AC.FT.)													
AVG 1978 THRU 1987	1.46	0.99	0.46	1.17	0.72	1.47	2.12	3.56	8.83	3.52	1.60	0.42	26.3
FY 1987	0.61	6.67	2.09	8.38	2.50	11.48	13.24	13.38	8.77	12.39	11.32	0.49	91.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.92	1.06	0.74	0.64	0.88	1.30	2.25	4.23	3.11	1.98	2.44	2.25	22.80
FY 1987	2.67	1.68	0.06	0.12	0.47	1.73	0.23	3.43	1.77	2.03	0.89	2.71	17.79
DEVIATION	0.75	0.62	-0.68	-0.52	-0.41	0.43	-2.02	-0.80	-1.34	0.05	-1.55	0.46	-5.01
POOL ELEVATION													
END OF MONTH	1639.40	1642.07	1642.22	1641.80	1643.09	1644.30	1643.27	1645.20	1645.67	1644.14	1641.95	1642.30	
MAXIMUM	1639.40	1642.90	1642.23	1642.67	1643.09	1644.30	1644.58	1645.20	1646.20	1645.67	1644.14	1642.30	
MINIMUM	1635.30	1639.33	1641.50	1641.67	1641.80	1642.40	1643.27	1641.55	1645.20	1644.14	1641.90	1641.93	
POOL CONTENT-EOM													
(1000AC.FT)	160.95	178.38	179.42	176.56	185.44	194.10	186.72	200.74	204.27	192.93	177.56	179.97	

RED RIVER BASIN

FORT COBB RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1981	2.94	1.88	2.05	2.27	2.38	3.09	4.10	6.26	5.89	2.86	1.85	2.41	38.0
FY 1987	27.79	4.81	3.63	5.62	7.98	5.42	3.06	34.62	17.99	3.00	1.91	2.89	118.7
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	1.94	2.77	0.00	0.54	0.65	0.63	0.00	0.17	7.90	0.93	0.15	0.22	15.9
FY 1987	20.23	27.98	0.05	6.49	6.77	5.36	0.00	0.00	39.96	2.93	0.00	2.61	112.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.37	1.39	1.18	1.00	1.12	1.62	2.64	4.78	3.67	2.28	2.47	3.07	27.59
FY 1987	5.41	2.70	0.65	1.02	1.77	1.50	0.04	6.86	7.05	1.57	2.85	5.79	37.21
DEVIATION	3.04	1.31	-0.53	0.02	0.65	-0.12	-2.60	2.08	3.38	-0.71	0.38	2.72	9.62
POOL ELEVATION													
END OF MONTH	1347.71	1342.37	1342.88	1342.43	1342.44	1341.97	1342.11	1349.04	1343.60	1342.87	1342.49	1341.99	
MAXIMUM	1349.82	1347.71	1342.88	1343.04	1342.61	1342.51	1342.12	1349.04	1351.01	1343.93	1342.87	1342.49	
MINIMUM	1346.53	1342.05	1342.36	1342.43	1342.00	1341.97	1341.97	1341.92	1343.30	1342.87	1342.49	1341.97	
POOL CONTENT-EOM													
(1000AC.FT)	105.60	81.55	83.67	81.80	81.84	79.89	80.47	112.16	86.75	83.63	82.05	79.97	

RED RIVER BASIN

ARBUCKLE RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1981	3.80	3.24	3.29	3.07	4.90	5.63	8.07	12.49	7.59	2.94	2.12	3.74	60.9
FY 1987	0.40	5.46	4.44	10.13	15.34	20.02	4.75	19.68	6.61	2.88	0.59	2.84	93.2
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	1.53	0.65	1.78	2.11	2.71	3.99	4.98	9.73	9.74	0.41	0.23	0.25	38.1
FY 1987	0.06	0.95	4.57	8.66	8.54	24.38	3.50	0.86	21.54	1.73	0.06	1.64	76.5
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.48	2.33	2.06	1.75	2.21	2.92	3.86	5.65	3.90	2.48	2.78	3.75	37.17
FY 1987	1.57	3.84	1.16	1.75	2.52	2.64	0.98	7.93	2.15	1.66	2.25	5.65	34.10
DEVIATION	-1.91	1.51	-0.90	0.00	0.31	-0.28	-2.88	2.28	-1.75	-0.82	-0.53	1.90	-3.07
POOL ELEVATION													
END OF MONTH	871.23	872.67	872.25	872.40	874.78	872.34	872.10	878.78	872.42	872.33	871.92	872.02	
MAXIMUM	871.65	872.91	872.73	873.67	874.78	875.39	872.49	878.78	879.37	873.08	872.33	872.62	
MINIMUM	871.23	871.18	872.04	872.15	871.96	871.77	871.94	872.09	872.20	872.33	871.92	871.79	
POOL CONTENT-EOM													
(1000AC.FT)	70.61	73.99	72.99	73.35	79.15	73.21	72.64	89.68	73.40	73.18	72.21	72.45	

RED RIVER BASIN

LAKE TEXOMA	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1906 THRU 1981	366.34	199.55	180.83	140.89	166.47	227.04	413.04	812.92	688.44	214.49	177.99	240.90	3828.9
FY 1987	1958.48	1034.97	510.35	579.17	924.10	1507.24	326.08	1064.33	2926.21	700.16	144.00	220.36	11895.5
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	373.47	307.21	176.90	203.00	162.64	326.70	245.91	374.13	949.92	372.01	149.19	116.72	3757.8
FY 1987	1719.47	1037.80	689.73	513.30	775.28	1619.88	350.24	339.36	2959.54	1234.67	223.93	196.82	11660.0
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.49	1.35	1.22	1.13	1.28	1.64	2.48	4.39	3.30	2.20	2.33	2.89	26.70
FY 1987	2.65	2.55	0.29	0.83	1.87	1.24	0.13	5.13	3.16	1.13	1.91	2.44	23.33
DEVIATION	0.16	1.20	-0.93	-0.30	0.59	-0.40	-2.35	0.74	-0.14	-1.07	-0.42	-0.45	-3.37
POOL ELEVATION													
END OF MONTH	619.24	619.08	617.03	617.63	619.08	617.59	616.88	623.99	623.28	617.27	615.74	615.65	
MAXIMUM	622.34	619.78	619.08	618.07	619.08	622.26	617.59	623.99	635.09	623.28	617.27	615.87	
MINIMUM	616.84	618.47	617.03	616.78	617.63	617.59	616.18	616.66	623.28	617.27	615.73	615.46	
POOL CONTENT-EOM													
(1000AC.FT)	2848.25	2833.08	2646.00	2700.00	2833.08	2696.40	2632.92	3321.86	3247.88	2667.60	2536.00	2528.80	

RED RIVER BASIN

MCGEE CREEK	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1976	0.00	0.00	0.00	0.00	0.00	0.00	18.50	17.98	10.32	4.03	1.97	4.72	57.5
FY 1987	0.00	0.00	0.00	0.00	0.00	0.00	3.08	24.99	2.79	0.46	0.00	1.19	32.5
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	0.00	0.00	0.00	0.00	0.00	0.00	5.02	6.08	3.33	3.45	2.99	3.40	24.27
FY 1987	0.00	0.00	0.00	0.00	0.00	0.00	0.23	2.66	2.49	1.73	1.08	3.18	11.37
DEVIATION	0.00	0.00	0.00	0.00	0.00	0.00	-4.79	-3.42	-0.84	-1.72	-1.91	-0.22	-12.90
POOL ELEVATION (1)													
END OF MONTH	0.00	0.00	0.00	0.00	0.00	0.00	153.90	165.37	165.73	165.58	165.28	165.32	
MAXIMUM	0.00	0.00	0.00	0.00	0.00	0.00	153.90	165.37	165.76	165.73	165.58	165.38	
MINIMUM	0.00	0.00	0.00	0.00	0.00	0.00	147.80	153.90	165.37	165.58	165.28	165.16	
POOL CONTENT-EOM													
(1000AC.FT)	0.00	0.00	0.00	0.00	0.00	0.00	3.06	27.95	29.60	28.91	27.54	27.72	

(1) ELEVATIONS ARE IN METERS

PAT MAYSE LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1937 THRU 1981	4.89	7.23	7.99	6.38	11.78	12.30	16.04	15.77	10.14	3.64	1.49	4.15	101.8
FY 1987	2.62	21.09	6.15	9.29	11.90	26.87	0.02	3.54	4.00	4.28	0.73	2.95	93.5
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	0.30	2.78	5.22	2.87	6.92	13.34	9.19	10.37	12.76	5.18	0.57	0.00	69.5
FY 1987	0.00	4.70	10.58	7.98	3.91	26.04	5.31	0.60	0.83	0.62	0.02	0.00	60.6
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.55	3.39	3.21	2.76	3.09	3.74	4.71	5.30	4.01	3.28	2.62	4.19	43.85
FY 1987	2.61	6.20	1.33	1.77	2.34	3.78	0.23	4.43	2.52	1.45	0.79	2.75	30.20
DEVIATION	-0.94	2.81	-1.88	-0.99	-0.75	0.04	-4.48	-0.87	-1.49	-1.83	-1.83	-1.44	-13.65
POOL ELEVATION													
END OF MONTH	450.47	452.88	451.90	451.88	452.90	452.65	451.28	451.24	451.17	451.01	450.23	450.17	
MAXIMUM	450.65	453.23	452.88	452.38	452.90	454.80	452.65	451.28	451.32	451.30	451.01	450.35	
MINIMUM	450.34	450.45	451.90	451.75	451.52	452.18	451.28	450.97	451.10	451.01	450.20	450.01	
POOL CONTENT-EOM													
(1000AC.FT)	121.37	136.05	129.99	129.87	136.18	134.63	126.21	125.96	125.54	124.56	119.96	119.60	

SARDIS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1981	9.07	15.39	20.38	21.79	26.99	30.93	39.85	39.52	19.88	6.87	2.66	9.87	245.9
FY 1987	0.31	1.36	5.79	24.61	18.33	37.73	10.35	57.40	10.99	4.99	1.61	8.09	181.6
RELEASES(1000AC.FT.)													
AVG 1985 THRU 1987	13.98	62.19	40.44	14.71	15.50	40.29	32.29	36.91	40.53	0.00	0.00	0.00	296.8
FY 1987	3.59	0.00	0.00	12.98	4.62	45.30	8.37	1.53	54.71	0.00	0.00	0.00	131.1
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.44	3.40	2.78	2.50	3.01	3.63	4.78	6.03	4.34	3.54	3.28	4.57	45.30
FY 1987	1.32	2.17	1.10	2.75	1.78	3.18	0.58	6.18	3.64	2.25	2.74	4.08	31.77
DEVIATION	-2.12	-1.23	-1.68	0.25	-1.23	-0.45	-4.20	0.15	-0.70	-1.29	-0.54	-0.49	-13.53
POOL ELEVATION													
END OF MONTH	597.89	597.89	598.26	599.03	599.89	599.05	598.83	602.33	598.91	598.84	598.45	598.74	
MAXIMUM	598.37	598.05	598.26	599.71	599.89	600.33	599.43	602.33	602.38	599.00	598.84	598.78	
MINIMUM	597.88	597.87	597.89	598.26	598.98	598.96	598.83	598.78	598.74	598.84	598.45	598.32	
POOL CONTENT-EOM													
(1000AC.FT)	259.52	259.52	264.42	274.75	286.68	275.03	272.06	322.21	273.13	272.19	266.97	270.85	

RED RIVER BASIN

HUGO LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1964	40.79	74.01	117.34	160.37	177.57	171.23	257.85	250.16	114.02	56.90	19.14	49.05	1485.4
FY 1987	17.99	70.21	60.83	137.85	111.47	263.21	46.71	172.07	95.80	21.22	3.49	13.29	1014.1
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	58.56	112.68	125.21	84.12	152.83	217.07	213.63	224.60	160.46	44.98	20.20	15.30	1429.6
FY 1987	8.64	24.54	76.90	163.91	68.85	260.60	39.29	60.27	192.81	19.80	41.81	14.02	971.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.65	3.75	3.19	2.85	3.27	3.92	5.03	6.09	4.24	3.54	3.31	4.55	47.39
FY 1987	2.05	2.81	0.92	2.17	1.34	2.71	0.55	3.76	2.89	1.90	1.77	2.76	25.63
DEVIATION	-1.60	-0.94	-2.27	-0.68	-1.93	-1.21	-4.48	-2.33	-1.35	-1.64	-1.54	-1.79	-21.76
POOL ELEVATION													
END OF MONTH	404.57	407.68	406.56	404.62	407.50	407.40	407.49	413.66	407.72	407.34	404.10	403.74	
MAXIMUM	404.63	408.40	407.68	408.62	407.50	411.08	407.75	413.70	413.66	407.84	497.34	404.10	
MINIMUM	403.93	404.55	406.35	404.62	404.49	404.50	407.40	407.42	407.59	407.34	404.10	403.60	
POOL CONTENT-EOM													
(1000AC.FT)	158.49	202.83	186.19	159.17	200.15	198.66	200.00	306.77	203.43	197.77	152.15	147.58	

RED RIVER BASIN

PINE CREEK LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1929 THRU 1981	22.63	38.04	56.04	60.24	78.03	82.93	95.41	104.78	42.28	17.31	8.38	22.66	628.7
FY 1987	15.11	43.72	46.12	70.95	61.29	116.23	18.50	63.99	20.73	11.44	0.04	13.49	481.6
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	25.33	51.33	64.25	41.02	66.32	90.19	76.57	92.85	69.12	14.86	6.81	9.85	608.5
FY 1987	13.68	44.14	44.98	71.24	39.00	127.96	7.04	24.68	55.75	18.48	5.22	13.63	465.8
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.76	3.89	3.59	3.12	3.48	4.25	5.15	6.21	4.28	3.87	3.53	4.67	49.80
FY 1987	1.71	1.29	0.86	1.61	1.26	2.41	0.41	3.89	1.92	1.78	1.39	2.63	21.16
DEVIATION	-2.05	-2.60	-2.73	-1.51	-2.22	-1.84	-4.74	-2.32	-2.36	-2.09	-2.14	-2.04	-28.64
POOL ELEVATION													
END OF MONTH	438.29	438.07	438.28	438.12	443.15	440.40	442.55	449.29	442.70	440.74	438.76	438.42	
MAXIMUM	438.58	440.02	440.71	441.28	443.15	449.04	442.77	450.01	449.29	442.78	440.74	439.78	
MINIMUM	438.00	438.07	438.00	437.92	438.02	438.13	440.40	442.33	442.35	440.74	438.73	437.86	
POOL CONTENT-EOM													
(1000AC.FT)	54.87	54.02	54.83	54.21	75.98	63.39	73.10	110.81	73.81	64.85	56.68	55.37	

BROKEN BOW LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1930 THRU 1981	34.81	58.40	95.11	111.71	114.40	140.87	130.36	138.16	52.17	26.71	14.15	23.55	940.4
FY 1987	30.15	70.81	62.48	66.45	84.50	161.06	15.77	33.62	17.71	5.81	0.00	4.96	553.3
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1987	28.39	55.21	93.69	61.69	71.48	100.82	113.43	100.87	90.15	51.44	35.44	23.06	825.7
FY 1987	12.89	26.59	64.95	64.31	88.77	157.64	48.61	17.11	15.16	21.45	16.74	15.12	549.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	4.14	4.08	4.15	3.72	3.83	4.89	5.28	6.29	4.31	4.23	3.69	4.60	53.21
FY 1987	4.12	3.48	2.24	1.57	2.75	4.07	0.20	2.23	1.90	1.39	1.90	3.76	29.61
DEVIATION	-0.02	-0.60	-1.91	-2.15	-1.08	-0.82	-5.08	-4.06	-2.41	-2.84	-1.79	-0.84	-23.60
POOL ELEVATION													
END OF MONTH	596.71	599.74	599.49	599.38	598.94	598.93	596.18	597.01	596.78	595.25	593.50	592.41	
MAXIMUM	596.83	599.74	600.31	600.15	599.61	603.87	598.93	597.01	597.25	596.83	595.25	593.50	
MINIMUM	595.51	596.64	599.46	599.33	597.65	597.93	596.17	595.41	596.70	595.25	593.50	592.41	
POOL CONTENT-EOM (1000AC.FT)	879.03	921.49	917.95	916.39	910.16	910.02	871.73	883.17	880.00	859.01	835.38	820.87	

EOT..

DEQUEEN LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1,000 AC. FT.)													
Avg 1930 thru 1987	7.6	14.1	21.6	23.2	24.7	30.4	29.0	29.7	10.8	6.0	3.8	6.1	207.0
WY 1987	4.9	20.0	13.6	13.5	18.8	35.8	3.2	5.5	3.9	1.0	1.1	4.7	126.0
Releases (1,000 AC. FT.)													
Avg 1979 thru 1987	10.6	17.6	29.9	13.9	20.3	27.7	29.2	28.9	21.3	11.0	4.8	3.5	218.7
WY 1987	4.0	19.3	14.3	13.4	9.1	45.1	3.3	3.4	4.6	2.1	2.1	15.9	136.6
Basin Rainfall (inches)													
Avg 1930 thru 1987	4.1	4.4	4.2	3.6	3.9	4.9	5.3	6.4	4.2	4.3	3.3	4.3	52.9
WY 1987	4.4	5.4	2.8	2.5	5.0	5.1	.2	5.3	2.7	3.6	2.7	6.0	45.7
Deviation	.3	1.0	-1.4	-1.1	1.1	.2	-5.1	-1.1	-1.5	-.7	-.6	1.7	-7.2
Pool Elevation													
End of Month	437.35	437.67	437.18	437.12	442.37	437.17	436.89	437.85	437.16	436.77	435.17	426.68	
Maximum	437.96	440.66	438.10	438.70	442.37	447.66	437.17	437.85	437.85	437.16	436.17	435.17	
Minimum	436.91	437.04	437.05	437.06	437.06	437.17	436.89	436.73	436.89	436.17	435.17	426.68	
Pool Content EOM (1,000 AC. FT.)	35.5	36.1	35.2	35.1	44.7	35.2	34.7	36.4	35.2	33.5	31.9	20.3	

GILLHAM LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1,000 AC. FT.)													
Avg 1930 thru 1987	13.9	25.6	40.7	44.3	44.1	55.8	49.2	48.8	19.8	10.6	5.0	9.7	367.5
WY 1987	8.7	28.3	23.0	21.7	27.7	73.2	6.6	5.9	4.4	2.0	3.1	13.8	218.4
Releases (1,000 AC. FT.)													
Avg 1977 thru 1987	10.6	28.0	48.9	29.9	34.6	47.1	61.1	48.0	32.6	12.7	9.3	3.9	366.7
WY 1987	8.3	26.9	23.8	21.8	16.5	80.9	9.8	1.9	7.8	3.4	3.3	9.7	214.1
Basin Rainfall (inches)													
Avg 1930 thru 1987	4.2	4.5	4.3	3.8	4.0	5.2	5.3	6.4	4.6	4.4	3.3	4.6	54.6
WY 1987	3.8	4.8	2.5	2.6	4.6	6.1	.6	5.4	2.7	3.4	3.9	6.5	46.9
Deviation	-.4	.3	-1.8	-1.2	.6	.9	-4.7	-1.0	-1.9	-1.0	.6	1.9	-7.7
Pool Elevation													
End of Month	502.13	503.05	502.35	502.22	509.62	504.51	502.01	504.60	501.92	515.49	500.02	502.82	
Maximum	503.46	507.95	504.54	505.29	509.62	524.69	504.51	504.60	504.86	517.02	500.62	506.54	
Minimum	501.87	502.07	502.10	502.08	502.08	502.23	501.94	502.01	501.88	515.49	499.71	499.71	
Pool Content EOM (1,000 AC. FT.)	33.2	34.5	33.5	33.3	44.5	36.6	33.0	36.7	32.9	31.2	30.4	34.2	

DIERKS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflow (1,000 AC. FT.)													
Avg 1930 thru 1987	4.8	9.6	16.4	18.7	17.6	22.0	19.5	20.8	7.2	4.2	1.1	3.1	145.0
WY 1987	5.2	14.4	12.0	9.7	11.0	32.0	3.3	1.6	.5	.1	.1	1.6	91.5
Releases (1,000 AC. FT.)													
Avg 1977 thru 1987	5.1	8.5	15.5	13.4	12.5	18.2	19.1	17.1	10.4	6.9	2.1	.9	129.7
WY 1987	14.8	14.2	11.9	9.9	4.3	28.5	13.2	.6	.7	1.0	1.0	.7	100.8
Basin Rainfall (inches)													
Avg 1930 thru 1987	4.7	4.6	4.5	3.9	4.2	5.1	5.3	6.2	4.9	4.0	3.2	4.0	54.6
WY 1987	6.2	5.8	3.4	2.6	4.5	7.5	.2	5.0	2.9	3.0	2.7	5.7	49.5
Deviation	1.5	1.2	-1.1	-1.3	.3	2.4	-5.1	-1.2	-2.0	-1.0	-.5	1.7	-5.1
Pool Elevation													
End of Month	517.12	517.24	517.29	517.02	522.94	525.55	516.83	517.50	517.02	515.49	513.83	514.54	
Maximum	526.36	522.01	520.68	518.94	522.94	531.43	525.55	517.50	517.50	517.02	515.49	514.64	
Minimum	516.97	517.03	516.95	517.02	517.01	517.38	516.83	516.51	516.97	515.49	513.83	513.18	
Pool Content EOM (1,000 AC. FT.)	19.1	19.3	19.4	19.1	25.7	29.1	18.9	19.6	19.1	17.6	16.1	16.7	

MILLWOOD LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflow (1,000 AC. FT.)													
Avg 1929 thru 1987	121.0	255.0	396.9	429.5	490.7	580.5	602.5	654.6	291.5	126.1	69.7	97.2	4115.2
WY 1987	91.4	301.2	347.7	343.2	317.7	987.0	154.6	57.3	122.8	57.4	29.8	64.7	2794.8
Releases (1,000 AC. FT.)													
Avg 1976 thru 1987	127.4	247.7	469.4	286.3	384.6	533.7	528.4	488.5	364.6	181.9	60.8	83.0	3756.3
WY 1987	85.5	290.2	352.6	335.5	271.5	942.7	159.0	36.9	127.5	39.9	28.7	126.5	2796.5
Intervening Basin Rainfall (inches)													
Avg 1930 thru 1987	3.8	4.3	3.9	3.4	3.8	4.4	4.8	5.8	4.0	3.4	2.8	3.8	48.2
WY 1987	4.4	5.5	3.1	2.5	4.7	5.3	.4	4.6	3.1	2.8	1.6	4.2	42.2
Deviation	.6	1.2	-.8	-.9	.9	.9	-4.4	-1.2	-.9	-.6	-1.2	.4	-6.0
Pool Elevation													
End of Month	259.24	259.52	259.28	259.45	260.85	259.58	259.22	259.68	259.21	259.48	259.11	256.49	
Maximum	259.53	260.46	260.37	259.97	260.85	263.14	259.79	259.65	259.72	259.54	259.48	259.11	
Minimum	259.17	259.24	259.24	259.28	259.37	259.00	259.21	259.21	259.27	259.21	259.04	256.49	
Pool Content EOM (1,000 AC. FT.)	206.3	214.7	207.5	212.6	256.1	216.5	205.7	218.6	205.4	213.5	202.5	133.9	

WRIGHT PATMAN LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC.FT)													
Avg 1957 thru 1982	77.	165.	220.	165.	229.	257.	286.	438.	195.	66.	19.	38.	2155.
WY 1987	11.	109.	266.	169.	151.	767.	26.	13.	55.	21.	2.	36.	1626.
Releases(1000 AC.FT)													
Avg 1957 thru 1982	109.	152.	191.	205.	216.	234.	200.	274.	252.	166.	52.	48.	2099.
WY 1987	70.	106.	191.	247.	92.	569.	209.	3.	1.	1.	1.	1.	1491.
Basin Rainfall (inches)													
Avg 1957 thru 1977	3.68	3.29	3.65	2.47	3.06	3.93	4.87	4.44	4.25	3.40	2.67	4.86	44.57
WY 1987	3.90	6.30	3.23	2.41	5.10	4.48	0.48	4.34	3.63	2.51	1.37	4.30	42.05
Deviation	0.22	3.01	-0.42	-0.06	2.04	0.55	-4.39	-0.10	-0.62	-0.89	-1.30	-0.56	-2.52
Pool Elevation													
End of Month	222.41	222.24	224.79	221.64	223.74	229.52	223.45	223.28	224.67	224.73	224.00	224.69	
Maximum	224.99	222.59	225.10	224.79	223.74	230.52	229.52	223.45	224.67	224.94	224.73	224.77	
Minimum	222.41	221.81	221.83	221.64	220.93	223.03	223.45	223.15	223.28	224.65	224.00	223.72	
Pool Content EOM (1000 AC. FT.)	199.	195.	263.	181.	233.	419.	226.	221.	259.	261.	240.	260.	

LAKE O THE PINES	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC.FT)													
Avg 1958 thru 1982	10.	25.	45.	53.	56.	75.	78.	64.	31.	10.	5.	13.	465.
WY 1987	8.	20.	46.	27.	64.	215.	8.	13.	16.	10.	5.	4.	436.
Releases(1000 AC.FT)													
Avg 1958 thru 1982	10.	15.	41.	49.	54.	68.	58.	53.	35.	15.	11.	13.	422.
WY 1987	7.	11.	58.	13.	29.	73.	150.	11.	2.	2.	2.	2.	360.
Basin Rainfall (inches)													
Avg 1957 thru 1977	3.07	3.53	3.69	2.59	3.16	3.73	4.90	4.01	3.73	2.79	2.33	3.93	41.46
WY 1987	4.92	5.50	5.04	2.50	6.66	4.67	0.31	2.77	5.31	3.13	1.66	3.12	45.59
Deviation	1.85	1.97	1.35	-0.09	3.50	0.94	-4.59	-1.24	1.58	0.34	-0.67	-0.81	4.13
Pool Elevation													
End of Month	228.76	229.08	228.31	228.94	230.60	236.59	229.96	229.66	229.92	229.85	229.32	228.98	
Maximum	228.96	229.27	229.43	229.35	230.60	236.88	236.59	229.96	230.03	230.11	229.85	229.32	
Minimum	228.52	228.74	228.31	228.31	228.60	230.60	229.96	229.40	229.42	229.85	229.32	228.92	
Pool Content EOM (1000 AC. FT.)	260.	266.	251.	263.	296.	432.	283.	277.	282.	281.	270.	264.	

NECHES RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
SAM RAYBURN RESERVOIR													
Inflows(1000 AC.FT)													
Avg 1908 thru 1982	40.	86.	172.	256.	258.	282.	289.	313.	136.	58.	34.	32.	1956.
WY 1987	66.	459.	433.	240.	440.	380.	80.	106.	153.	65.	32.	59.	2513.
Releases(1000 AC.FT)													
Avg 1965 thru 1982	52.	42.	62.	94.	114.	143.	146.	209.	190.	147.	143.	92.	1434.
WY 1987	126.	67.	181.	483.	197.	542.	209.	106.	53.	84.	146.	139.	2333.
Basin Rainfall (inches)													
Avg 1931 thru 1960	3.15	4.67	5.02	4.65	4.18	3.69	4.64	5.22	3.55	3.72	2.93	2.87	48.29
WY 1987	5.47	7.92	5.35	1.90	11.08	2.34	0.58	4.65	5.83	2.85	1.97	3.73	53.67
Deviation	2.32	3.25	0.33	-2.75	6.90	-1.35	-4.06	-0.57	2.28	-0.87	-0.96	0.86	5.38
Pool Elevation													
End of Month	161.83	165.17	167.14	164.95	166.85	165.24	163.73	163.37	163.83	163.18	161.57	160.37	
Maximum	162.69	165.17	167.17	167.22	166.85	167.95	165.24	163.80	163.83	163.96	163.18	161.57	
Minimum	161.83	161.76	164.94	164.95	164.38	165.24	163.73	163.37	162.97	163.18	161.57	160.37	
Pool Content EOM (1000 AC. FT.)	2613.	2987.	3223.	2962.	3188.	2996.	2822.	2782.	2834.	2761.	2585.	2459.	

NECHES RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
B.A. STEINHAGEN LAKE													
Inflows(1000 AC.FT)													
Avg 1908 thru 1982	74.	151.	284.	438.	439.	495.	514.	607.	290.	141.	81.	67.	3581.
WY 1987	158.	363.	549.	697.	442.	977.	378.	177.	194.	155.	183.	179.	4452.
Releases(1000 AC.FT)													
Avg 1951 thru 1982	96.	130.	234.	313.	338.	376.	408.	601.	294.	178.	122.	108.	3198.
WY 1987	160.	374.	531.	700.	433.	989.	362.	185.	188.	156.	165.	179.	4422.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.92	4.25	4.71	4.10	3.59	3.92	4.60	5.00	3.43	3.27	2.81	2.85	45.45
WY 1987	5.38	7.33	5.30	1.95	5.80	2.59	0.56	5.15	5.82	3.09	1.67	3.45	48.09
Deviation	2.46	3.08	0.59	-2.15	2.21	-1.33	-4.04	0.15	2.39	-0.18	-1.14	0.60	2.64
Pool Elevation													
End of Month	82.70	81.64	82.92	82.61	83.17	81.96	82.80	81.83	81.90	81.34	82.28	81.83	
Maximum	83.36	83.90	83.10	83.12	83.17	83.17	83.25	82.80	83.39	82.58	82.98	83.32	
Minimum	81.32	81.64	80.32	81.26	81.75	81.22	81.96	81.30	81.80	81.02	81.34	81.80	
Pool Content EOM (1000 AC. FT.)	90.	77.	93.	89.	97.	81.	92.	79.	80.	74.	85.	79.	

TRINITY RIVER BASIN

BENBROOK LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC.FT)													
Avg 1924 thru 1982	2.	3.	2.	3.	6.	7.	9.	14.	6.	2.	1.	1.	56.
WY 1987	1.	2.	4.	5.	11.	17.	4.	14.	33.	6.	2.	1.	100.
Releases(1000 AC.FT)													
Avg 1952 thru 1982	1.	4.	2.	2.	4.	5.	5.	10.	11.	2.	2.	1.	49.
WY 1987	1.	1.	1.	2.	4.	23.	3.	3.	32.	11.	2.	2.	85.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.83	2.22	2.30	2.06	2.06	2.36	3.79	4.75	3.28	2.16	2.10	2.44	32.35
WY 1987	2.90	3.07	2.68	1.51	4.26	1.21	0.38	8.26	4.75	1.57	1.07	1.91	33.57
Deviation	0.07	0.85	0.38	-0.55	2.20	-1.15	-3.41	3.51	1.47	-0.59	-1.03	-0.53	1.22
Pool Elevation													
End of Month	693.13	693.22	693.83	694.24	695.95	694.11	693.72	696.19	695.92	693.73	692.82	692.15	
Maximum	693.44	693.23	693.83	694.44	695.95	697.54	694.12	696.19	699.00	695.92	693.73	692.82	
Minimum	693.13	693.06	693.20	693.83	694.24	694.05	693.72	693.71	695.91	693.73	692.82	692.15	
Pool Content EOM (1000 AC. FT.)	85.	85.	88.	89.	96.	89.	87.	97.	96.	87.	84.	81.	

TRINITY RIVER BASIN

JOE POOL LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC.FT)													
Avg 1924 thru 1966	4.	7.	5.	10.	14.	7.	2.	1.	1.	2.	2.	4.	59.
WY 1987	3.	2.	5.	3.	13.	3.	1.	16.	11.	2.	1.	1.	61.
Releases(1000 AC.FT)													
Avg 1986 thru 1986	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WY 1987	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Basin Rainfall (inches)													
Avg 1951 thru 1980	3.25	2.27	1.96	1.73	2.13	2.61	4.41	4.74	2.74	1.89	2.01	3.62	33.36
WY 1987	4.44	2.69	2.95	1.52	3.26	1.25	0.51	7.98	6.09	1.70	1.38	2.29	36.06
Deviation	1.19	0.42	0.99	-0.21	1.13	-1.36	-3.90	3.24	3.35	-0.19	-0.63	-1.33	2.70
Pool Elevation													
End of Month	501.74	502.04	502.98	503.52	506.19	506.55	506.28	508.99	510.51	510.07	509.38	508.93	
Maximum	501.77	502.05	502.98	503.54	506.19	506.67	506.55	508.99	510.73	510.55	510.07	509.38	
Minimum	501.16	501.69	502.00	502.96	503.52	506.19	506.28	506.26	508.98	510.07	509.38	508.93	
Pool Content EOM (1000 AC. FT.)	61.	62.	66.	69.	81.	83.	81.	95.	103.	100.	97.	95.	

TRINITY RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
RAY ROBERTS LAKE													
Inflows(1000 AC FT)													
Avg 1924 thru 1969	6.	9.	9.	10.	17.	19.	29.	39.	19.	6.	3.	10.	177.
WY 1987	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.	17.	19.
Releases(1000 AC.FT)													
Avg 1986 thru 1986	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WY 1987	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.96	2.33	2.53	2.14	2.65	2.53	4.08	5.05	3.88	2.57	2.43	2.88	36.03
WY 1987	3.86	3.23	1.96	2.51	5.09	2.53	0.07	7.41	4.99	2.55	1.61	4.04	39.85
Deviation	0.90	0.90	-0.57	0.37	2.44	0.00	-4.01	2.36	1.11	-0.02	-0.82	1.16	3.82
Pool Elevation													
End of Month	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	551.00	556.00	558.00	571.33	
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	551.00	556.00	558.00	571.33	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	551.00	551.00	556.00	558.00	
Pool Content EOM													
(1000 AC. FT.)	0.	0.	0.	0.	0.	0.	0.	0.	1.	2.	3.	19.	

TRINITY RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
LEWISVILLE LAKE													
Inflows(1000 AC.FT)													
Avg 1924 thru 1982	41.	30.	26.	24.	42.	57.	74.	99.	52.	19.	11.	29.	504.
WY 1987	25.	25.	30.	74.	99.	168.	23.	142.	141.	22.	7.	10.	775.
Releases(1000 AC.FT)													
Avg 1954 thru 1982	30.	45.	44.	27.	25.	33.	33.	71.	77.	41.	31.	22.	479.
WY 1987	14.	12.	18.	63.	46.	165.	85.	15.	200.	34.	24.	12.	688.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.96	2.33	2.53	2.14	2.65	2.53	4.08	5.05	3.88	2.57	2.43	2.88	36.03
WY 1987	3.57	3.62	2.11	2.26	4.74	2.09	0.10	8.77	4.92	2.60	1.99	3.25	40.02
Deviation	0.61	1.29	-0.42	0.12	2.09	-0.44	-3.98	3.72	1.04	0.03	-0.44	0.37	3.99
Pool Elevation													
End of Month	514.84	515.15	515.55	515.75	518.11	517.87	514.79	519.43	516.58	515.26	513.53	512.75	
Maximum	515.34	515.17	515.62	516.76	518.11	520.58	517.87	519.43	519.77	516.63	515.26	513.53	
Minimum	514.67	514.76	515.02	515.37	515.08	517.87	514.79	514.60	516.58	515.26	513.53	512.75	
Pool Content EOM													
(1000 AC. FT.)	454.	461.	471.	475.	534.	528.	453.	568.	495.	464.	424	407	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
GRAPEVINE LAKE													
Inflows(1000 AC.FT)													
Avg 1924 thru 1962	11.	6.	7.	9.	13.	16.	24.	30.	15.	5.	2.	6.	144.
WY 1987	7.	5.	10.	17.	43.	42.	5.	58.	38.	10.	0.	0.	235.
Releases(1000 AC.FT)													
Avg 1952 thru 1982	4.	8.	12.	9.	6.	6.	10.	12.	15.	13.	11.	5.	111.
WY 1987	7.	2.	2.	21.	13.	38.	33.	3.	61.	31.	4.	3.	218.
Basin Rainfall (inches)													
Avg 1931 thru 1960	3.13	2.19	2.24	1.90	2.26	2.26	3.89	4.46	3.28	2.56	2.48	2.78	33.43
WY 1987	3.78	3.38	2.42	2.05	5.08	2.07	0.43	8.32	6.04	2.47	2.38	2.89	41.31
Deviation	0.65	1.19	0.18	0.15	2.82	-0.19	-3.46	3.86	2.76	-0.09	-0.10	0.11	7.88
Pool Elevation													
End of Month	534.64	534.75	535.81	535.05	538.84	539.14	534.98	541.62	538.27	534.77	533.27	532.23	
Maximum	535.40	534.75	535.83	536.94	538.84	540.78	539.14	541.62	541.82	538.27	534.77	533.27	
Minimum	534.64	534.48	534.74	535.05	535.04	538.84	534.98	534.98	538.27	534.77	533.26	532.23	
Pool Content EOM (1000 AC. FT.)	179.	179.	187.	181.	210.	213.	181.	233.	206.	179.	169.	162.	

TRINITY RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
LAVON LAKE													
Inflows(1000 AC.FT)													
Avg 1924 thru 1982	14.	19.	23.	25.	35.	37.	53.	69.	37.	13.	3.	12.	340.
WY 1987	7.	16.	18.	23.	52.	88.	11.	59.	76.	14.	7.	9.	380.
Releases(1000 AC.FT)													
Avg 1953 thru 1982	13.	14.	26.	20.	15.	21.	15.	58.	37.	14.	7.	4.	244.
WY 1987	0.	0.	0.	0.	0.	74.	0.	0.	66.	13.	0.	0.	153.
Basin Rainfall (inches)													
Avg 1931 thru 1960	3.28	2.87	2.99	2.47	2.82	3.37	4.57	5.24	3.99	2.86	2.71	2.67	39.84
WY 1987	3.23	4.28	2.21	1.93	4.65	2.58	0.17	7.94	5.65	2.12	1.02	4.52	40.30
Deviation	-0.05	1.41	-0.78	-0.54	1.83	-0.79	-4.40	2.70	1.66	-0.74	-1.69	1.85	0.46
Pool Elevation													
End of Month	489.13	489.27	489.60	490.17	492.09	491.99	491.40	493.17	492.63	491.17	489.49	488.64	
Maximum	489.67	489.27	489.61	490.19	492.09	493.31	492.03	493.17	494.10	492.63	491.17	489.49	
Minimum	489.13	488.86	489.17	489.54	490.17	491.99	491.40	491.32	492.63	491.17	489.49	488.64	
Pool Content EOM (1000 AC. FT.)	398.	401.	408.	419.	459.	457.	444.	482.	470.	439.	405	389.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
NAVARRO MILLS LAKE													
Inflows(1000 AC.FT)													
Avg 1908 thru 1982	5.	6.	8.	10.	10.	12.	19.	29.	14.	4.	1.	3.	121.
WY 1987	21.	28.	21.	12.	15.	9.	4.	32.	47.	0.	1.	1.	191.
Releases(1000 AC.FT)													
Avg 1963 thru 1982	2.	7.	6.	4.	6.	7.	9.	16.	22.	8.	0.	2.	89.
WY 1987	14.	11.	25.	21.	1.	19.	1.	21.	35.	14.	0.	0.	162.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.64	2.60	2.61	2.62	2.80	2.67	4.36	4.98	3.50	1.82	1.60	2.64	34.84
WY 1987	7.12	3.51	2.61	1.71	3.28	1.74	0.77	8.56	6.26	1.30	1.06	3.61	41.53
Deviation	4.48	0.91	0.00	-0.91	0.48	-0.93	-3.59	3.58	2.76	-0.52	-0.54	0.97	6.69
Pool Elevation													
End of Month	424.62	427.45	426.53	424.51	426.87	424.52	424.46	426.08	427.53	424.18	423.33	422.85	
Maximum	426.10	427.58	427.45	426.53	426.87	427.32	424.77	426.26	431.45	427.53	424.18	423.33	
Minimum	423.77	424.55	424.55	424.51	424.51	424.41	424.28	424.45	425.89	424.18	423.32	422.85	
Pool Content EOM (1000 AC. FT.)	58.	73.	68.	57.	70.	57.	57.	65.	74.	55.	51.	49.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
BARDWELL LAKE													
Inflows(1000 AC.FT)													
Avg 1938 thru 1982	3.	3.	4.	4.	6.	6.	11.	14.	7.	2.	1.	2.	63.
WY 1987	9.	13.	10.	7.	17.	10.	3.	9.	18.	2.	1.	1.	100
Releases(1000 AC.FT)													
Avg 1965 thru 1982	1.	5.	3.	3.	4.	6.	6.	12.	11.	2.	0.	1.	54.
WY 1987	5.	7.	16.	7.	6.	19.	1.	2.	21.	1.	0.	0.	85.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.90	2.73	2.94	2.53	2.81	2.73	4.11	4.81	3.09	1.98	2.16	2.74	35.53
WY 1987	5.92	3.75	2.53	1.82	4.81	1.63	1.15	7.56	5.34	2.01	1.30	3.04	40.86
Deviation	3.02	1.02	-0.41	-0.71	2.00	-1.10	-2.96	2.75	2.25	0.03	-0.86	0.30	5.33
Pool Elevation													
End of Month	421.65	422.92	421.26	421.15	423.84	421.06	421.08	422.58	421.22	420.71	420.00	419.70	
Maximum	422.27	422.94	422.92	421.55	423.84	424.69	421.33	422.58	424.35	421.25	420.71	420.00	
Minimum	420.91	421.03	421.04	421.06	421.03	420.99	421.06	421.08	421.22	420.71	420.00	419.70	
Pool Content EOM (1000 AC. FT.)	55.	59.	53.	53.	63.	53.	53.	58.	53.	51.	49.	48.	

SAN JACINTO BASIN

BARKER RESERVOIR	OCT 86	NOV 86	DEC 86	JAN 87	FEB 87	MAR 87	APR 87	MAY 87	JUN 87	JUL 87	AUG 87	SEP 87	TOTAL
Inflows(1000 Ac.Ft.)													
Aug 1945 thru 1987	6.0	6.7	6.9	9.3	8.0	4.1	5.0	8.0	10.4	7.2	4.1	7.4	83.1
FY 87	9.6	9.6	28.6	9.0	10.7	4.0	1.2	8.2	30.0	4.2	1.7	2.7	119.5
Releases(1000 Ac.Ft.)													
Aug 1964 thru 1987	7.2	7.3	7.1	8.4	8.6	5.6	4.0	8.7	9.9	7.4	3.8	8.7	86.7
FY 87	9.5	4.8	16.0	26.6	3.7	10.4	1.2	6.5	20.4	13.3	1.7	2.7	116.8
Rainfall(Inches)													
Aug 1945 thru 1987	3.79	3.65	3.25	2.99	3.0	3.11	3.06	4.52	4.07	2.20	3.79	4.23	39.67
FY 87	4.99	6.66	5.18	N/A	3.83	1.02	0.3	6.56	10.27	3.60	1.26	2.82	46.48
Pool Elevation													
End of Month	73.92	87.12	90.63	73.93	87.33	73.66	73.68	84.33	88.73	73.70	75.79	74.42	
Maximum	86.27	87.12	91.20	90.60	87.33	87.74	73.79	84.33	91.39	88.73	75.79	75.73	
Minimum	72.71	73.69	73.92	73.92	73.66	73.67	73.64	73.71	82.94	73.20	73.70	73.70	
Pool Content E.O.M. (1000 Ac.Ft.)	0	6.28	18.56	0	6.79	0	0	1.67	10.84	0	0	0	
ADDICKS RESERVOIR													
Inflows(1000 Ac.Ft.)													
Aug 1948 thru 1987	6.7	6.8	7.1	6.3	7.6	3.8	5.5	8.0	7.6	5.5	5.7	6.5	77.1
FY 87	11.5	9.1	24.9	7.7	9.7	3.0	1.9	6.1	27.7	6.3	1.8	2.4	112.1
Releases(1000 Ac.Ft.)													
Aug 1964 thru 1987	8.2	8.2	7.8	7.5	8.0	4.7	4.6	9.2	8.7	5.9	4.2	7.9	84.9
FY 87	11.5	4.7	17.0	20.6	5.0	11.3	1.9	5.5	26.2	13.9	1.8	2.4	121.8
Rainfall(Inches)													
Aug 1948 thru 1987	4.06	3.6	3.31	2.97	3.22	2.18	3.16	4.36	3.97	3.20	3.43	4.37	38.76
FY 87	5.6	5.35	4.46	N/A	3.35	0.78	0.44	5.01	9.54	2.89	0.93	2.40	40.75
Pool Elevation													
End of Month	71.74	89.04	93.14	71.70	89.51	71.70	71.72	84.62	91.17	71.81	72.58	71.82	
Maximum	89.62	89.04	94.03	93.10	89.68	89.30	76.27	84.62	94.86	91.17	73.04	77.35	
Minimum	71.71	71.71	71.92	71.70	71.68	71.67	71.68	71.67	72.26	71.71	71.74	71.75	
Pool Content E.O.M. (1000 Ac.Ft.)	0	4.35	13.47	0	4.97	0	0	1.08	7.91	0	0	0	

N/A Not Available

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
WHITNEY LAKE													
Inflows(1000 AC.FT)													
Avg 1899 thru 1982	120.	68.	67.	55.	60.	68.	135.	279.	170.	99.	72.	106.	1299.
WY 1987	333.	93.	95.	93.	132.	240.	207.	176.	528.	58.	14.	16.	1985.
Releases(1000 AC.FT)													
Avg 1951 thru 1982	99.	57.	39.	51.	43.	55.	61.	216.	180.	83.	53.	71.	1008.
WY 1987	317.	81.	97.	80.	103.	274.	202.	78.	572.	83.	46.	29.	1962.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.88	1.94	2.16	1.96	2.25	2.06	3.49	4.76	2.97	2.07	1.81	2.76	31.1
WY 1987	3.86	2.31	3.44	1.47	4.08	1.29	0.34	7.81	6.16	1.20	0.74	2.01	34.7
Deviation	0.98	0.37	1.28	-0.49	1.83	-0.77	-3.15	3.05	3.19	-0.87	-1.07	-0.75	3.6
Pool Elevation													
End of Month	533.47	533.74	533.54	533.93	534.99	533.34	533.12	536.64	534.37	532.64	530.39	529.20	
Maximum	535.18	533.74	533.74	534.65	534.99	537.82	534.43	536.64	539.35	534.48	532.64	530.39	
Minimum	532.95	533.27	533.19	533.40	532.99	533.34	533.12	533.06	534.17	532.64	530.38	529.20	
Pool Content EOM (1000 AC. FT.)	638.	645.	640.	649.	675.	635.	630.	717.	660.	619.	568.	542.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
AQUILLA LAKE													
Inflows(1000 AC.FT)													
Avg 1939 thru 1971	4.	3.	4.	4.	5.	4.	12.	17.	6.	3.	0.	1.	63.
WY 1987	6.	2.	6.	4.	11.	5.	1.	11.	36.	1.	1.	4.	88.
Releases(1000 AC.FT)													
Avg 1982 thru 1982	0.	0.	0.	0.	0.	1.	3.	1.	0.	0.	0.	0.	5
WY 1987	1.	2.	4.	6.	3.	11.	0.	1.	35.	6.	0.	0.	69.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.75	2.40	2.75	2.30	2.70	2.40	4.25	4.50	3.15	2.00	1.75	3.00	33.9
WY 1987	6.68	2.58	3.37	0.77	2.64	1.46	0.29	5.88	6.56	1.46	1.09	4.29	37.0
Deviation	3.93	0.18	0.62	-1.53	-0.06	-0.94	-3.96	1.38	3.41	-0.54	-0.66	1.29	3.1
Pool Elevation													
End of Month	538.01	537.87	538.44	537.71	539.78	537.55	537.40	539.95	539.62	537.33	536.75	537.41	
Maximum	538.27	538.01	538.69	538.44	539.78	539.78	537.61	539.95	545.51	539.62	537.33	537.61	
Minimum	537.05	537.51	537.71	537.71	537.60	537.51	537.40	537.38	539.07	537.33	536.75	536.63	
Pool Content EOM (1000 AC. FT.)	54	54.	56.	53.	60.	53.	52.	61.	60.	52.	50.	52.	

BRAZOS RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
HACO LAKE													
Inflows(1000 AC.FT)													
Avg 1907 thru 1982	25.	16.	20.	18.	24.	26.	47.	70.	31.	14.	8.	17.	316.
WY 1987	21.	22.	48.	33.	32.	46.	18.	57.	117.	11.	3.	5.	413.
Releases(1000 AC.FT)													
Avg 1965 thru 1982	9.	14.	13.	16.	20.	29.	36.	75.	30.	16.	3.	5.	266.
WY 1987	12.	18.	38.	39.	17.	55.	12.	17.	146.	5.	1.	1.	361.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.58	2.19	2.50	2.26	2.39	2.09	3.83	4.83	2.88	2.14	1.67	3.00	32.36
WY 1987	5.10	2.57	3.66	1.36	3.52	1.47	0.86	6.96	5.85	0.87	1.18	2.67	36.07
Deviation	2.52	0.38	1.16	-0.90	1.13	-0.62	-2.97	2.13	2.97	-1.27	-0.49	-0.33	3.71
Pool Elevation													
End of Month	455.53	455.58	456.58	455.34	457.01	455.18	455.24	459.82	455.24	454.94	453.86	453.56	
Maximum	456.01	455.69	457.68	456.68	457.01	457.33	455.35	459.82	462.12	455.70	454.94	453.86	
Minimum	454.82	455.10	455.10	455.30	455.04	455.07	455.08	455.08	455.18	454.94	453.86	453.49	
Pool Content EOM (1000 AC. FT.)	153.	153.	161.	152.	164.	151.	151.	186.	151.	149.	141.	139.	

BRAZOS RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
PROCTOR LAKE													
Inflows(1000 AC.FT)													
Avg 1922 thru 1982	3.	2.	1.	3.	2.	5.	5.	12.	5.	2.	1.	3.	44.
WY 1987	8.	4.	11.	4.	17.	30.	10.	95.	60.	34.	5.	2.	280.
Releases(1000 AC.FT)													
Avg 1963 thru 1982	3.	3.	2.	3.	6.	4.	9.	11.	9.	8.	4.	2.	64.
WY 1987	5.	2.	12.	3.	10.	31.	12.	13.	57.	84.	20.	3.	252.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.71	1.66	1.76	1.65	1.69	1.55	3.06	4.68	2.75	2.08	1.65	2.73	27.97
WY 1987	4.17	3.01	2.88	1.04	8.37	1.36	0.69	10.17	5.34	0.22	2.05	3.31	42.61
Deviation	1.46	1.35	1.12	-0.61	6.68	-0.19	-2.37	5.49	2.59	-1.86	0.40	0.58	14.64
Pool Elevation													
End of Month	1161.94	1162.28	1162.03	1162.10	1163.46	1162.91	1161.91	1175.01	1174.93	1166.49	1162.47	1161.70	
Maximum	1162.39	1162.30	1162.47	1162.20	1163.46	1165.05	1162.91	1175.01	1176.41	1174.93	1166.49	1162.47	
Minimum	1161.76	1161.84	1162.03	1162.01	1162.10	1162.91	1161.91	1161.91	1174.64	1166.49	1162.47	1161.70	
Pool Content EOM (1000 AC. FT.)	59.	61.	60.	60.	66.	64.	59.	139.	138.	82.	62.	58.	

BRAZOS RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
BELTON LAKE													
Inflows(1000 AC.FT)													
Avg 1908 thru 1982	31.	21.	31.	31.	36.	37.	65.	103.	49.	24.	14.	26.	468.
WY 1987	48.	44.	97.	65.	55.	103.	42.	67.	231.	95.	36.	13.	896.
Releases(1000 AC.FT)													
Avg 1954 thru 1982	25.	23.	20.	26.	26.	37.	34.	61.	66.	46.	14.	9.	387.
WY 1987	36.	42.	44.	99.	43.	104.	52.	15.	65.	185.	118.	6.	809.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.61	2.11	2.28	2.10	2.21	1.96	3.56	4.66	2.89	2.07	1.69	2.92	31.06
WY 1987	5.58	2.89	3.82	1.04	3.37	1.84	0.89	6.27	6.77	0.63	1.09	3.37	37.56
Deviation	2.97	0.78	1.54	-1.06	1.16	-0.12	-2.67	1.61	3.88	-1.44	-0.60	0.45	6.50
Pool Elevation													
End of Month	594.75	594.49	598.28	595.40	596.09	595.53	594.07	597.59	608.45	601.47	594.24	593.96	
Maximum	595.30	595.00	598.65	598.28	596.09	596.89	595.53	597.59	609.58	608.56	601.47	594.24	
Minimum	594.09	594.16	594.12	595.40	593.98	595.53	594.07	594.07	597.59	601.47	594.17	593.96	
Pool Content EOM (1000 AC. FT.)	451.	448.	497.	460.	469.	461.	443.	488.	644.	541.	445.	441.	

BRAZOS RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
STILLHOUSE HOLLOW LAKE													
Inflows(1000 AC.FT)													
Avg 1924 thru 1982	14.	10.	12.	15.	22.	23.	26.	46.	21.	10.	5.	11.	215.
WY 1987	38.	36.	73.	56.	35.	51.	25.	31.	130.	26.	6.	10.	517.
Releases(1000 AC.FT)													
Avg 1968 thru 1982	8.	7.	9.	13.	13.	16.	21.	35.	25.	23.	3.	6.	179.
WY 1987	22.	45.	29.	87.	34.	47.	33.	18.	26.	122.	13.	6.	482.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.78	2.16	2.33	2.02	2.13	1.84	3.35	4.42	2.99	1.98	1.92	3.11	31.03
WY 1987	7.82	2.61	4.07	0.96	2.90	1.68	1.10	6.57	7.13	1.31	1.45	4.47	42.07
Deviation	5.04	0.45	1.74	-1.06	0.77	-0.16	-2.25	2.15	4.14	-0.67	-0.47	1.36	11.04
Pool Elevation													
End of Month	624.10	622.50	628.70	624.02	623.88	624.21	622.62	624.20	637.71	624.09	622.13	622.05	
Maximum	624.79	624.10	628.70	628.70	624.02	624.96	624.21	624.20	639.55	637.71	624.09	623.09	
Minimum	621.98	622.09	622.29	624.02	622.07	623.88	622.09	622.04	624.20	624.09	622.10	622.05	
Pool Content EOM (1000 AC. FT.)	249.	239.	281.	249.	248.	250.	240.	250.	351.	249.	237.	236.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
GEORGETOWN LAKE													
Inflows(1000 AC.FT)													
Avg 1980 thru 1982	4.	2.	1.	1.	1.	1.	2.	14.	27.	3.	1.	9.	66.
WY 1987	5.	5.	21.	13.	7.	9.	4.	4.	52.	24.	2.	1.	147.
Releases(1000 AC.FT)													
Avg 1980 thru 1982	3.	2.	1.	0.	0.	0.	1.	4.	13.	16.	1.	9.	50.
WY 1987	3.	5.	12.	21.	5.	9.	4.	3.	7.	69.	1.	1.	140.
Basin Rainfall (inches)													
Avg 1931 thru 1960	3.16	2.50	2.38	2.16	2.37	2.03	3.61	4.01	2.89	1.77	2.12	3.46	32.4
WY 1987	9.15	2.14	5.37	0.80	3.09	1.41	1.00	6.69	10.92	1.45	1.78	4.08	47.8
Deviation	5.99	-0.36	2.99	-1.36	0.72	-0.62	-2.61	2.68	8.03	-0.32	-0.34	0.62	15.4
Pool Elevation													
End of Month	791.26	791.05	796.78	791.24	792.48	791.78	791.70	792.49	816.66	791.18	790.78	790.81	
Maximum	792.22	791.87	799.10	796.78	792.48	793.43	793.39	792.49	817.89	816.66	791.18	791.01	
Minimum	789.73	790.97	791.05	791.11	791.02	790.85	791.27	790.98	792.49	791.17	790.78	790.65	
Pool Content EOM (1000 AC. FT.)	37.	37.	45.	37.	39.	38.	38.	39.	83.	37.	37.	37.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
GRANGER LAKE													
Inflows(1000 AC.FT)													
Avg 1980 thru 1982	10.	8.	4.	4.	5.	7.	9.	24.	63.	22.	4.	19.	179.
WY 1987	27.	16.	75.	36.	24.	28.	13.	39.	111.	58.	7.	6.	440.
Releases(1000 AC.FT)													
Avg 1980 thru 1982	9.	8.	2.	2.	2.	1.	5.	13.	35.	45.	4.	18.	144.
WY 1987	20.	18.	37.	75.	15.	34.	12.	11.	59.	125.	7.	3.	416.
Basin Rainfall (inches)													
Avg 1931 thru 1960	3.16	2.50	2.38	2.16	2.37	2.03	3.61	4.01	2.89	1.77	2.12	3.46	32.4
WY 1987	8.08	2.34	6.09	0.77	3.18	1.50	0.94	6.97	9.14	2.12	1.49	5.07	47.6
Deviation	4.92	-0.16	3.71	-1.39	0.81	-0.53	-2.67	2.96	6.25	0.35	-0.63	1.61	15.2
Pool Elevation													
End of Month	505.49	504.78	511.80	504.33	506.11	504.41	504.21	509.59	516.88	505.20	504.39	504.36	
Maximum	507.19	505.49	512.43	511.80	506.11	506.59	504.66	509.59	522.04	516.88	505.20	504.48	
Minimum	504.02	504.18	504.41	504.19	504.15	504.19	504.05	504.06	509.59	505.20	504.28	504.35	
Pool Content EOM (1000 AC. FT.)	72.	69.	106.	67.	75.	67.	66.	93.	141.	71.	67.	67.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
SOMERVILLE LAKE													
Inflows(1000 AC.FT)													
Avg 1924 thru 1982	13.	14.	17.	22.	23.	19.	29.	38.	22.	12.	3.	10.	222.
WY 1987	11.	37.	121.	14.	51.	28.	4.	17.	202.	22.	10.	4.	521.
Releases(1000 AC.FT)													
Avg 1967 thru 1982	11.	12.	14.	9.	17.	16.	22.	33.	33.	21.	5.	5.	198.
WY 1987	4.	22.	37.	62.	54.	61.	5.	0.	51.	113.	56.	1.	466.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.66	3.10	3.15	2.89	2.87	2.44	3.71	3.95	3.43	2.35	2.45	3.09	36.09
WY 1987	5.53	4.19	6.11	1.02	4.23	1.45	0.69	7.64	8.05	1.43	0.79	2.74	43.87
Deviation	2.87	1.09	2.96	-1.87	1.36	-0.99	-3.02	3.69	4.62	-0.92	-1.66	-0.35	7.78
Pool Elevation													
End of Month	238.22	239.32	245.26	241.76	241.35	238.41	237.89	238.98	248.80	242.39	238.01	237.77	
Maximum	238.45	239.33	245.43	245.26	241.76	242.10	238.41	238.98	250.74	248.80	242.39	238.01	
Minimum	237.84	238.03	238.13	241.76	238.35	238.41	237.89	237.86	238.98	242.39	238.01	237.77	
Pool Content EOM (1000 AC. FT.)	163.	176.	257.	207.	201.	165.	159.	172.	315.	215.	160.	158.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
TWIN BUTTES LAKE													
Inflows(1000 AC.FT)													
Avg 1963 thru 1982	4.	2.	2.	2.	2.	2.	3.	5.	2.	1.	4.	5.	34.
WY 1987	0.	0.	87.	9.	16.	15.	11.	16.	13.	7.	6.	8.	188.
Releases(1000 AC.FT)													
Avg 1963 thru 1982	2.	2.	2.	2.	2.	2.	4.	6.	4.	6.	4.	2.	38.
WY 1987	0.	0.	0.	0.	0.	0.	0.	1.	0.	3.	7.	0.	11.
Basin Rainfall (inches)													
Avg 1931 thru 1960	1.81	0.76	0.91	0.89	0.83	0.83	1.74	2.89	1.83	1.74	1.45	2.37	18.05
WY 1987	6.37	1.40	2.93	0.40	3.47	1.77	1.29	6.60	4.32	0.84	1.73	2.50	33.62
Deviation	4.56	0.64	2.02	-0.49	2.64	0.94	-0.45	3.71	2.49	-0.90	0.28	0.13	15.57
Pool Elevation													
End of Month	1922.57	1923.75	1925.37	1926.93	1929.66	1931.80	1933.03	1934.43	1935.80	1935.68	1934.73	1935.23	
Maximum	1922.57	1923.75	1925.37	1926.93	1929.66	1931.80	1933.03	1934.43	1935.80	1936.00	1935.68	1935.23	
Minimum	1917.26	1922.57	1923.75	1925.37	1926.93	1929.66	1931.80	1933.03	1934.43	1935.68	1934.62	1934.64	
Pool Content EOM (1000 AC. FT.)	69.	77.	86.	94.	109.	122.	130.	140.	150.	149.	142.	145.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
O.C. FISHER LAKE													
Inflows(1000 AC.FT)													
Avg 1915 thru 1982	4.	0.	0.	0.	1.	1.	4.	6.	3.	3.	1.	7.	30.
WY 1987	27.	1.	1.	1.	3.	3.	2.	5.	4.	1.	1.	2.	51.
Releases(1000 AC.FT)													
Avg 1953 thru 1982	2.	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	3.
WY 1987	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Basin Rainfall (inches)													
Avg 1931 thru 1960	1.88	0.75	1.04	0.84	0.84	0.86	1.59	2.71	1.91	2.09	1.65	2.18	18.34
WY 1987	6.62	1.16	2.72	0.47	3.66	1.65	0.95	5.90	3.47	0.61	2.62	2.82	32.65
Deviation	4.74	0.41	1.68	-0.37	2.82	0.79	-0.64	3.19	1.56	-1.48	0.97	0.64	14.31
Pool Elevation													
End of Month	1896.89	1896.59	1896.60	1896.39	1897.01	1897.31	1897.24	1897.93	1898.15	1897.56	1896.91	1896.66	
Maximum	1897.05	1897.01	1896.63	1896.60	1897.01	1897.35	1897.32	1897.93	1898.16	1898.15	1897.56	1896.98	
Minimum	1888.73	1896.59	1896.45	1896.39	1896.39	1897.01	1897.17	1897.10	1897.93	1897.56	1896.82	1896.66	
Pool Content EOM (1000 AC. FT.)	68.	67.	67.	66.	68.	69.	69.	71.	72.	70.	68.	67.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTA
HORDS CREEK LAKE													
Inflows(1000 AC.FT)													
Avg 1942 thru 1982	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.	2.
WY 1987	1.	0.	0.	0.	0.	1.	0.	3.	1.	0.	0.	0.	6.
Releases(1000 AC.FT)													
Avg 1953 thru 1982	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WY 1987	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.49	1.31	1.44	1.56	1.29	1.25	2.90	4.49	2.73	2.38	1.94	3.04	26.
WY 1987	6.27	2.76	2.76	0.64	4.04	1.42	0.42	8.39	3.49	1.16	3.33	0.00	34.
Deviation	3.78	1.45	1.32	-0.92	2.75	0.17	-2.48	3.90	0.76	-1.22	1.39	-3.04	7.
Pool Elevation													
End of Month	1886.90	1886.74	1887.16	1887.31	1888.25	1889.95	1889.84	1896.67	1898.22	1897.53	1897.16	1896.76	
Maximum	1887.09	1886.92	1887.16	1887.31	1888.25	1889.95	1889.98	1896.67	1898.30	1898.22	1897.53	1897.16	
Minimum	1885.14	1886.68	1886.65	1887.16	1887.31	1888.25	1889.84	1889.69	1896.67	1897.53	1896.80	1896.76	
Pool Content EOM (1000 AC. FT.)	3.	3.	3.	3.	4.	4.	4.	7.	7.	7.	7.	7.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTA
MARSHALL FORD LAKE													
Inflows(1000 AC.FT)													
Avg 1941 thru 1982	127.	63.	52.	76.	81.	85.	125.	237.	165.	97.	86.	108.	1302.
WY 1987	344.	160.	305.	167.	118.	266.	76.	236.	1115.	179.	59.	131.	3156.
Releases(1000 AC.FT)													
Avg 1944 thru 1982	69.	65.	50.	48.	55.	69.	98.	175.	173.	130.	118.	80.	1130.
WY 1987	196.	211.	180.	255.	118.	262.	118.	135.	1096.	246.	105.	138.	3060.
Basin Rainfall (inches)													
Avg 1931 thru 1960	2.39	1.46	1.42	1.13	1.18	1.27	2.46	3.27	2.50	2.02	2.03	2.76	23.
WY 1987	6.79	2.20	3.56	0.71	3.05	1.63	1.03	6.33	5.83	1.53	2.75	3.19	38.
Deviation	4.40	0.74	2.14	-0.42	1.87	0.36	-1.43	3.06	3.33	-0.49	0.72	0.43	14.
Pool Elevation													
End of Month	683.63	680.78	687.01	682.42	682.26	682.18	679.58	684.45	684.97	680.88	677.65	676.66	
Maximum	684.50	683.63	687.15	687.01	682.42	683.52	682.19	684.45	693.48	684.97	680.88	677.65	
Minimum	676.01	680.78	679.49	682.42	679.24	682.18	679.58	679.17	684.45	680.88	677.65	676.37	
Pool Content EOM (1000 AC. FT.)	1222.	1167.	1290.	1199.	1196.	1194.	1145.	1239	1249.	1169.	1110.	1092.	

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
CANYON LAKE													
Inflows(1000 AC.FT)													
Avg 1915 thru 1982	31.	16.	17.	20.	21.	23.	31.	40.	30.	22.	18.	27.	296.
WY 1987	92.	53.	116.	75.	51.	66.	40.	86.	385.	158.	52.	30.	1204.
Releases(1000 AC.FT)													
Avg 1964 thru 1982	17.	17.	12.	14.	18.	19.	21.	26.	30.	22.	27.	17.	240.
WY 1987	80.	68.	69.	116.	41.	61.	50.	38.	137.	301.	171.	78.	1210.
Basin Rainfall (inches)													
Avg 1931 thru 1960	3.05	1.67	2.18	2.07	2.20	2.00	3.00	4.03	2.98	2.40	2.07	4.02	31 67
WY 1987	9.08	2.28	5.45	0.78	3.60	1.58	0.73	8.94	9.52	5.09	2.10	2.49	51.64
Deviation	6.03	0.61	3.27	-1.29	1.40	-0.42	-2.27	4.91	6.54	2.69	0.03	-1.53	19.97
Pool Elevation													
End of Month	910.85	908.78	914.16	909.13	910.08	910.42	908.81	914.12	937.52	923.93	910.13	903.56	
Maximum	912.36	910.85	915.40	914.16	910.08	911.35	910.42	914.12	942.67	937.52	923.93	910.13	
Minimum	908.93	908.78	908.71	909.13	908.84	910.08	908.81	908.56	914.12	923.93	910.09	903.56	
Pool Content EOM (1000 AC. FT.)	397.	380.	426.	383.	391.	394.	380.	426.	668.	518.	391.	339.	

NAVAJO DAM

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
FY 1987	150.67	137.27	63.13	40.00	60.61	144.15	300.06	323.63	325.23	122.96	66.43	36.50	1770.64
Releases (1000 Ac-Ft)													
FY 1987	104.25	147.18	173.16	173.60	132.82	203.85	270.00	209.34	295.15	226.23	49.20	48.00	2032.78
Rainfall (Inches)	Data Unavailable												
Pool Elevation (EOM)	6075.35	6074.59	6066.60	6056.15	6050.08	6044.58	6046.30	6254.36	6054.20	6042.01	6041.00	6038.53	
Maximum	6075.35	6076.78	6074.48	6056.98	6055.75	6050.06	6046.30	6254.36	6055.67	6053.91	6041.97	6040.96	
Minimum	6072.23	6074.59	6066.60	6056.15	6050.08	6044.58	6041.44	6046.64	6053.66	6042.01	6040.30	6038.53	
Pool Content (EOM) (1000 Ac-Ft)	1551.60	1540.70	1430.00	1296.00	1222.90	1160.00	1179.30	1273.90	1272.00	1131.50	1120.50	1094.00	

PLATORO RESERVOIR [1]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
FY 1987	3.21	2.07	.67	.69	.68	.87	3.07	16.97	35.28	8.18	2.80	1.10	75.59
Releases (1000 Ac-Ft)													
FY 1987	3.21	2.06	2.19	2.21	.51	1.30	9.34	19.83	19.50	14.72	5.34	1.53	81.74
Rainfall (Inches)	DATA IS NOT AVAILABLE												
Pool Elevation(EOM)	10026.0	10025.9	10024.2	10022.5	10021.0	10020.5	10012.4	10008.8	10027.5	10020.2	10017.2	10016.7	
Maximum	10026.2	10026.2	10025.7	10024.1	10022.5	10021.0	10020.6	10013.6	10027.9	10028.8	10019.8	10017.2	
Minimum	10026.0	10025.9	10024.2	10022.5	10021.0	10020.5	10011.3	10004.9	10009.1	10020.2	10017.2	10016.7	
Pool Content (EOM)													
(1000 Ac-Ft)	52.14	52.05	50.51	48.99	47.67	42.23	40.40	37.53	53.51	46.97	44.38	43.96	

ABIQUIU DAM

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1926 thru 1987	12.06	13.80	12.19	5.37	9.71	19.67	51.04	97.15	53.19	25.87	25.66	18.03	343.74
FY 1987	40.63	44.82	31.97	29.17	32.27	46.06	138.06	151.80	31.60	11.56	15.69	23.55	597.18
Releases (1000 Ac-Ft)													
Avg 1963 thru 1987	10.90	22.04	22.45	11.09	12.89	22.81	46.34	67.52	56.35	32.50	24.27	17.97	346.83
FY 1987	15.95	29.16	29.25	25.95	92.24	99.95	96.97	33.88	19.53	44.83	63.61	69.91	621.23
Rainfall (Inches)													
Avg 1957 thru 1987	.98	.49	.37	.38	.28	.57	.54	.79	.72	1.65	1.87	1.16	9.80
FY 1987	.89	1.03	.26	.84	.78	.05	.28	1.60	1.25	1.26	1.94	.26	10.44
Pool Elevation (EOM)	6249.66	6252.23	6252.58	6253.00	6241.88	6230.60	6238.68	6259.37	6260.74	6254.40	6245.40	6235.98	
Maximum	6249.71	6252.23	6252.65	6254.65	6252.71	6241.41	6238.68	6259.37	6261.06	6260.70	6254.08	6245.04	
Minimum	6245.50	6249.64	6252.33	6252.55	6241.88	6230.60	6227.95	6239.56	6259.52	6254.40	6245.40	6235.98	
Pool Content (EOM)													
(1000 Ac-Ft)	335.28	349.83	351.84	354.25	293.25	237.60	276.82	391.92	400.29	362.35	311.90	263.34	

[1] Data for compiling averages unavailable

COCHITI LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1910 thru 1987	48.89	54.61	49.10	41.53	47.62	80.86	139.06	274.12	205.94	86.16	57.42	44.18	1129.50
FY 1987	85.27	119.28	95.06	77.35	146.42	182.56	302.27	442.72	243.74	104.16	87.68	77.33	1963.84
Releases (1000 Ac-Ft)													
Avg 1975 thru 1987	40.00	53.25	57.35	51.36	60.89	85.36	140.91	242.54	228.65	146.74	68.13	47.88	1223.06
FY 1987	77.51	112.76	108.97	75.81	145.42	143.71	165.28	291.66	232.50	309.59	77.76	39.16	1780.19
Rainfall (Inches)													
Avg 1967 thru 1987	1.23	.73	.63	.61	.41	.67	.65	.96	.75	1.77	2.21	1.52	12.15
FY 1987	2.86	3.21	.80	.50	.69	.07	.16	2.08	.85	.62	2.33	.19	14.36
Pool Elevation (EOM)	5336.10	5340.31	5330.22	5331.34	5331.95	5355.14	5400.47	5431.00	5432.20	5385.58	5388.00	5398.10	
Maximum	5336.10	5340.31	5342.00	5332.41	5339.97	5355.14	5400.47	5431.85	5434.50	5431.35	5388.00	5398.10	
Minimum	5330.25	5330.20	5330.11	5329.64	5329.98	5333.19	5355.27	5402.84	5426.16	5385.58	5378.64	5388.37	
Pool Content (EOM) (1000 Ac-Ft)	58.50	64.72	50.58	52.02	52.82	90.95	226.42	374.73	381.96	172.61	180.70	217.13	

GALISTEO DAM

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1971 thru 1987													
FY 1987	INFLOW = OUTFLOW												
Releases (1000 Ac-Ft)													
Avg 1971 thru 1987	.45	.09	.09	.08	.09	.16	.21	.30	2.61	.15	.93	.65	4.47
FY 1987	.38	.45	.27	.10	.21	.41	.23	.26	.05	.01	.16	. 0	2.53
Rainfall (Inches)													
Avg 1971 thru 1987	1.16	.66	.41	.45	.57	.48	.69	.89	.60	1.41	1.52	1.19	10.04
FY 1987	2.17	2.84	1.05	.08	.65	.35	.12	1.58	1.11	.90	3.87	.16	14.88
Pool Elevation (EOM)	NO END OF MONTH STORAGE DURING THE YEAR												
Maximum													
Minimum													
Pool Content (EOM) (1000 Ac-Ft)	0	0	0	0	0	0	0	0	0	0	0	0	

JEMEZ CANYON DAM

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1953 thru 1987	2.44	1.83	1.61	1.66	1.95	4.41	18.53	15.51	3.04	1.28	2.38	1.56	55.41
FY 1987	9.40	8.44	4.56	2.74	4.16	8.62	35.42	20.25	8.71	5.63	1.48	.29	109.70
Releases (1000 Ac-Ft)													
Avg 1954 thru 1987	2.03	1.97	1.41	1.56	1.74	3.89	11.13	12.77	6.32	3.01	2.76	1.33	49.92
FY 1987	11.48	7.17	4.62	2.11	4.09	8.48	6.69	3.69	29.63	23.40	1.33	.16	102.85
Rainfall (Inches)													
Avg 1953 thru 1987	1.07	.49	.44	.39	.37	.48	.38	.66	.53	1.28	1.56	1.12	8.77
FY 1987	2.04	1.96	.90	.40	.38	.05	.37	1.27	.41	.77	1.96	.02	10.53
Pool Elevation (EOM)	5196.12	5196.81	5196.59	5196.72	5196.54	5196.19	5213.09	5220.19	5209.23	5196.90	5196.19	5195.46	
Maximum	5198.10	5197.07	5196.86	5196.76	5196.78	5196.60	5213.09	5220.19	5220.24	5208.79	5196.99	5196.18	
Minimum	5196.12	5196.00	5196.59	5196.24	5196.45	5196.12	5196.09	5213.51	5209.23	5196.90	5196.19	5195.46	
Pool Content (EOM) (1000 Ac-Ft)	28.57	29.53	29.22	29.40	29.15	28.67	56.56	72.00	49.20	29.65	28.67	27.68	

SANTA ROSA LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1981 thru 1987	4.11	2.49	1.78	1.76	2.20	5.15	10.15	22.19	20.21	7.89	14.26	6.33	98.50
FY 1987	6.89	8.65	4.40	2.69	7.53	14.12	23.84	41.80	25.43	3.37	12.23	3.92	154.87
Releases (1000 Ac-Ft)													
Avg 1981 thru 1987	.99	1.32	.65	.60	1.19	2.05	2.42	14.46	13.13	15.38	10.03	7.44	69.67
FY 1987	4.53	7.89	3.16	1.48	5.45	13.38	15.12	37.36	27.38	2.54	9.30	2.65	130.24
Rainfall (Inches)													
Avg 1981 thru 1987	2.07	1.08	.70	.52	.49	.63	.77	1.71	1.96	1.37	3.64	1.65	16.60
FY 1987	2.72	3.23	1.16	.97	0	.66	1.20	4.74	1.95	.11	4.57	1.61	22.92
Pool Elevation (EOM)	4746.21	4746.13	4746.18	4746.26	4746.51	4746.20	4748.02	4748.68	4747.70	4747.25	4747.54	4747.50	
Maximum	4746.58	4746.75	4746.30	4746.30	4746.51	4746.54	4748.02	4749.71	4749.36	4747.47	4747.83	4747.64	
Minimum	4745.89	4746.06	4746.11	4746.09	4746.10	4746.09	4746.08	4748.00	4747.70	4747.18	4747.22	4747.43	
Pool Content (EOM) (1000 Ac-Ft)	106.55	106.25	106.44	106.74	107.70	106.51	113.62	116.27	112.35	110.57	111.71	111.56	

TWO RIVERS RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1964 thru 1987	1.16	.93	.72	.77	.58	.85	1.19	.94	.53	.41	1.30	1.59	10.99
FY 1987	8.13	8.11	4.94	4.48	4.70	8.69	10.79	7.05	3.31	.24	1.00	.56	62.00
Releases (1000 Ac-Ft)													
Avg 1964 thru 1986	1.16	.93	.71	.79	.59	.85	1.19	.94	.49	.43	1.26	1.59	10.92
FY 1987	8.12	7.93	4.85	4.62	4.83	8.69	10.79	7.05	3.29	.24	1.00	.56	61.97
Rainfall (Inches)													
Avg 1964 thru 1986	.91	.38	.17	.18	.30	.22	.34	.68	1.55	1.77	2.77	1.89	10.82
FY 1987	Data Unavailable												
Pool Elevation (EOM)	0	3980.00	3981.33	3979.02	0	0	0	0	0	0	0	0	0
Maximum	3979.96	3986.70	3982.23	3981.17	3978.82	3981.00	3981.48	3979.77	3980.23	0	0	0	0
Minimum													
Pool Content (EOM) (1000 AC-FT)	0	.18	.27	.13	0	0	0	0	0	0	0	0	0

09

SUMNER LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
FY 1987	Data Unavailable												
Releases (1000 Ac-Ft)													
FY 1987	8.71	1.43	5.77	8.01	8.13	18.29	29.90	43.43	29.62	10.46	20.86	16.10	200.71
Rainfall (Inches)													
FY 1987	3.35	2.15	1.77	.86	1.12	.53	.27	1.85	1.69	.14	3.46	1.39	18.58
Pool Elevation (EOM)	4261.1	4265.2	4266.2	4265.9	4266.1	4265.4	4262.0	4260.9	4261.0	4259.7	4258.1	4255.3	
Maximum	4261.2	4265.2	4266.4	4266.2	4266.2	4266.1	4266.0	4262.0	4261.3	4261.0	4261.0	4258.1	
Minimum	4260.5	4260.9	4265.2	4265.9	4265.7	4265.4	4262.0	4259.3	4260.4	4259.7	4258.1	4254.6	
Pool Content (EOM) (1000 Ac-Ft)	63.70	64.18	67.44	66.45	67.11	64.81	54.30	51.13	51.42	47.81	43.60	36.80	

SECTION VII - MINUTES OF THE ARKANSAS RIVER COORDINATING COMMITTEE MEETING AND THE ANNUAL RESERVOIR CONTROL CENTER MEETING

1. RESERVOIR CONTROL CENTER

2. ARKANSAS RIVER BASIN

MINUTES

1987 ANNUAL RESERVOIR CONTROL CENTER MEETING
SOUTHWESTERN DIVISION
CORPS OF ENGINEERS
3 AND 4 NOVEMBER 1987

1. INTRODUCTION AND REMARKS. The 1987 Annual Reservoir Control Center (RCC) meeting was held on 3 and 4 November 1987 in the Southwestern Division (SWD) office, Dallas, Texas. Mr. Charles Sullivan, Chief, RCC began the meeting by asking each participant to introduce himself. After introductions, Mr. H. Estus Walker, Chief, Water Management Branch welcomed the group to SWDO and stated that those who were directly involved in water control activities should consider themselves fortunate because of the kind work responsibility required, i.e., work is tangible and can see work accomplishments in short timeframes. Encouraged the group to pay special attention to Mr. Carroll Scoggins', Tulsa District, presentation on "Arkansas River Flood of September-October 1986, Action Issues", topic No. III of agenda. He emphasized the importance of water control manual development and requirements of keeping them current. Deviations from approved plans of regulation should be exceptions in lieu of the norm. He asked that all deviations be requested through the RCC prior to request going to the Executive office. Often times this procedure results in different opinions on requested deviations. Aside from RCC activities, Mr. Walker thought it to be appropriate to discuss some items concerning the hydrology arena since several branch chiefs were present. In a recent meeting held in the Tulsa District where Engineering and Planning Division Chiefs were present. Mr. Walker stated that he emphasized the importance of early-on hydrologic analyses in the initial stages of feasibility, reconnaissance studies, etc., to include funding, scheduling, etc.. Early involvement should minimize delays in study progress. At this point, Mr. Sullivan summarized agenda topics and asked that discussion begin as outlined below. The agenda and attendance list are enclosed as attachments 1 and 2, respectively.

2. DISTRICT STATUS REPORTS.

a. FORT WORTH DISTRICT. Mr. Arnold Escobar reported that eight of their 24 reservoir projects were visited during the past year. Topics such as water control manuals, gate changes, transfer of data, etc., were discussed with project personnel. In April 1987 District Representatives met local residents representing both upstream and downstream interest groups at Lake O'Pines to discuss the regulation procedures for the lake. Arnold felt the meeting was a success. Also met with the Lower Colorado River Authority, Operating Agency, to discuss forecasting procedures for Marshall Ford Reservoir (Section 7 project).

In July the District completed an aerial video of the Leon, Little and Lampass Rivers downstream of Belton and Stillhouse Hollow Lakes to observe problem areas with flows ranging from of 6,000 to 10,000 cfs. The District experienced above normal runoff for FY87 with 20 to 24 of its lakes storing water in their flood pools. The May-June flood established record pool levels at Stillhouse Hollow, Aquilla and Somerville Lakes in the Brazos River Basin; and Canyon Lake in the Guadalupe River Basin. At this point, Mr. Escobar "Hilited" the major flood operations at Canyon Lake for the past year. He stated that Canyon rose within 0.33 feet of its emergency spillway crest which was caused by large inflows and the project's inability to release because of downstream flows in excess of channel capacities. In July, a tragic event occurred upstream of Canyon where a church bus with passengers was swept into a rapidly rising river which was caused by torrential rains near Hunt, Texas. Several drownings occurred. In September a special operation was initiated at Canyon to draw the lake level to elevation 900 (9 feet below top of conservation pool) to assist in the start of construction of a Non-Federal Hydropower plant by the Guadalupe-Blanco River Authority (GBRA).

Two contracts were awarded during the year to complete water control manuals and currently the District is in the process of awarding an additional contract to develop forecasting models for reservoir regulations. At this point, Mr. Walker requested that contracting of work should be made known to Executive Office in order to emphasize the need for additional manpower.

The District completed a water quality report for Wright Patman Lake. At Grapevine Lake a destratification system was installed by the City of Grapevine in May 1987. The purpose of the system is to prevent soluble iron and manganese from entering into the lake. Effectiveness of system is yet to be determined, the city estimates that the system needs to be in place a year before an evaluation can be made.

Resurvey reports for Bardwell and Proctor Lakes were completed and submitted for approval during the past year. Funds are available for a resurvey of Stillhouse Hollow Lake for FY88. Cooperative programs were continued with funds being transferred in the amounts of $103,439 to the NWS, $682, 540 to the USGS for the stream gaging program and $80,000 for DCP maintenance. Flood damages prevented in FY87 totaled $154,911,600 which exceeded the FY86 total by $47,000,000.

b. LITTLE ROCK DISTRICT. The District experienced a moderate year in terms of water control activities except for the October 1986 flood on the Arkansas River as reported by Mr. James Proctor. The District's greatest concerns have been low flow and low pool level conditions since mid-spring. Lakes in the White River Basin are down 25 to 30 percent. Dierks Lake in the Little River system is down 80 percent where the lake level was lowered for the fish management plan. The lake has not refilled due to

the lack of runoff. No problems at this point; but, could have problems in meeting water supply needs if runoff does not pick-up. A general discussion took place on the use of fish management plans. The concensus of the group was that plans are beneficial and that each time a plan is proposed for implementation, an analysis is made considering impacts on project purposes and uses.

The entrance channel to the McClellan-Kerr navigation system is extremely low due low flow on both the White and Mississippi Rivers. The water surface has dropped to 108.2 as compared to its design surface of 110 feet NGVD. As flows receded, dredging increased in order to maintain navigable depths. However, with the dredging and restrictions on tow sizes, the district has been able to maintain navigation. Jim stated that special interests items were:

(1) The Reservoir Control Section converted to almost exclusive use of DCP's for project and river station data in March 1987. This conversion eliminated the manual receipt of the morning report data except for hydropower releases which are still transmitted by radio.

(2) Beaver leakage. The left abutment dike of the dam is founded on Cherty Limestone where leakage through the limestone has been observed since construction. Extensive grouting was done in the late 60's without totally stopping the leakage. In December 1984, Beaver reached a record high pool level which caused the leakage rates to increase. To minimize the leakage, the project is being regulated to a lower top of flood control pool. Because of Beaver's leakage problems, it has been given the highest priority as a potential dam safety problem within SWD. In order to eliminate the problem, a plan is being devised to repair the structure by placing a 1,200 to 1400 feet long concrete curtain wall extending across the dike. The wall will be 2 feet thick and up to 200 feet deep. The technology to make this repair is European in origin; therefore, contract proposals are expected from German and French firms. Work is expected to start in early FY89 at an estimated cost of $14 million.

(3) Army tests for the "Bradley Infantry Fighting Vehicle". The Army Equipment Test Division out of Ft. Benning, Georgia and WES selected the Arkansas River at LD#13 as an ideal site for a swim test of the vehicle. This is the latest armored tracked vehicle which is to provide the mechanized infantry the ability to keep pace with the new Abrams Tank. To date it has not done so well in water. The Army is testing modifications and is trying to define its capability to swim under different flow conditions. The next series of tests are scheduled to begin this week with plans to test water velocities from zero to approximately 5 m.p.h.

(4) Gillham Lake Vibration Problems. No additional tests were made during the past year due to low lake levels.

However, the problem has also been observed during low flow releases.

(5) Marketing of Hydropower. The district continues to have some problems with the SWPA and one of their marketing agents (AECI) in their methods of scheduling power generations at Corps' project. In the White River Basin, the concern is with dictating the schedules to the Corps in lieu of a coordinated effort by both agencies. A meeting is scheduled during the month of November 1987 to discuss these concerns.

(6) Acoustic Velocity Meter (AVM). Problems still exist with the interfacing of the AVM with the DCP's; however, the meter has been checked for its data collection ability and its accuracy. The solution of this problem will be further investigated during the year. The district is confident that the AVM is a good instrument and plans to use them at other locations.

c. GALVESTON DISTRICT. Mr. Ed Reindl reported that channel deficiency problems exist downstream of their Addicks and Barker Reservoirs due to encroachments. Hydrology and Hydraulics personnel visited Addicks and Barker projects to observe the raising of the projects' embankments and to review operational procedures with project personnel. Sediment activities included the use of videos to demonstrate where sediment deposits are taking place on federally-owned lands of Addicks and Barker due to man-made channels. The district has an agreement with the City of Houston and the County concerning the maintenance of channel work and removal of sediment deposits. Ed also stated that the district is currently studying methods in which they can link into a flood warning system that has been developed by the County.

d. ALBUQUERQUE DISTRICT. Mr. Dick Kreiner reported that they visited eight of their 14 projects during the past year. Unable to visit the remainder of the projects due to its workload. All of the major river basins required flood control operations during the year. In the Rio Grande river basin, Abiquiu, Cochiti, and Jemez Canyon reached record pool levels. Releases were restricted from these Corps projects because of channel capacity problems in the Rio Grande River below El Paso, Texas. At Abiquiu Lake, special operations will be required for two years in order that the non-federal hydropower plant can be constructed. Installation of the conduit liner for the powerplant is scheduled to begin on 1 December 1987, at this time conduit releases will be stopped and downstream water needs will be pumped (50 cfs) over the dam. Abiquiu operated under a deviation from 4 October 1986 to 22 January 1987 while repairs to the structure (flip bucket and stilling basin wall) were being made due to damage from falling rocks. Cochiti was operated to maintain a 50,000 acre-foot flood buffer in Elephant Butte Reservoir during the spring runoff and 25,000 acre-feet during winter months for downstream flood protection. On 10 July 1987 the Rio Grande Compact approved a waiver on the requirement to

carry over 1987 flood water in Cochiti during the summer. The waiver was rescinded on 7 August 1987.

The U.S. Boundary Commission is currently repairing the river channel below El Paso, Texas, which has eroded over the past few years from sustained flows. Releases from Cochiti have been restricted because of the channel work and has required the storage of some of the 1987 flood waters. This storage will be evacuated during the period of November 1987 through February 1988. John Martin Reservoir, Arkansas River Basin, reached a new record pool level on 31 May 1987. The downstream channel had not sustained flows since the mid-sixties; consequently, the channel has deteriorated and releases to the design channel capacity of 3,000 cfs caused many complaints of agricultural damages. Trinidad Lake located on the Purgatorie River reached its maximum pool of record on 20 June 1987. As with most other projects, the downstream channel has deteriorated from the initial design capacity of 15,000 cfs. However, work is currently in progress to restore the 15,000 cfs capacity. Flood waters will be held in the irrigation pool until channel work is complete. On the Pecos River flood control regulation consisted of regulating flows to non-damaging stages at the Brantley Dam site. Santa Rosa and Sumner reached record pool levels.

The Albuquerque District hosted a meeting in August 1987 with the SCS, NWS, IBWC, USBR and States of Colorado, New Mexico and Texas to discuss ways of improving the snowmelt runoff forecasts for the Rio Grande River Basin. Dick felt that the meeting was beneficial. Sediment activities included the completion of a new area-capacity table for Trinidad Lake and was put into use on 1 November 1987. New area-capacity tables for Cochiti and Conchas Reservoirs are scheduled to be completed during the upcoming Fiscal Year. Because of high spring runoff on the Rio Grande, a reconnaissance hydrographic survey was made on Cochiti Lake to supplement and/or compare data collected in the 1986 survey. Total damages prevented by both Corps and Section 7 projects exceeded $100 million in the States of Colorado, New Mexico and Kansas.

e. TULSA DISTRICT. Mr. Larry Harp reported that water control activities were normal for FY87 except for the October 1986 flood over the Arkansas River Basin and the May-June 1987 flood over the Upper Red River Basin. Arkansas River flows were about 230 percent of normal. The above normal flows were caused by the September-October 1986 flood which produced several record stages along the Arkansas River and produced record pool levels at 15 projects. Eleven of these projects either filled or exceeded their flood control capacity. Special releases were made from Copan in July and Fort Gibson and Eufaula in August to alleviate fish kills in their stilling basins.

Flows in the Upper Red River Basin were above normal for much of the year. Record pool levels were set at Fort Cobb, Lake Kemp and Tom Steed Reservoirs from the October 1986 flood. However, the May-June 1987 flood caused these reservoirs to even exceed

pool levels of the October 1986 flood.

Reservoir control personnel visited 21 projects during the year where flood control operations and data reporting procedures were reviewed. Larry stated that three major water quality studies were conducted for Broken Bow, the Lake Texoma net pan aqua-culture demonstration project and for the proposed mid-Arkansas River Basin dam sites. Sediment activities for the past year included surveys for other districts. Lake Nasworthy was surveyed for the Fort Worth District. Surveys and data processing were done at Cochiti and Santa Rosa Lakes in the Albuquerque District.

3. TULSA DISTRICT - ARKANSAS RIVER FLOOD OF SEPTEMBER-OCTOBER 1986 ACTION ISSUES. Mr. Carroll Scoggins, Chief, Hydrology and Hydraulics Branch of the Tulsa District shared with the group action issues they experienced during the flood. Carroll began his discussion by stating that all information presented may or may not apply to all districts.

During the course of the flood event, the reservoir control group was inundated by telephone calls from the general public, news media, etc. The overtaxing of key personnel with information requests has required the district to set-up a Public Information Center (PIC). The Center will only be activated during major flood events. During normal activities, reservoir control personnel will continue to receive calls. In the area of data collection, the district has taken steps to remove gages from bridges and replacing them on higher terrain. Most of their emphasis is being placed on those gages associated with gated structures that are located above metropolitan areas. The USGS has been required to also install staff gages to insure data at high flows and to extend rating curves upward to include flows on the magnitude of the PMF. Thirty additional DCP's have been ordered for spares. Mr. Scoggins stated the lack of ample rainfall data was a big hinderance in making timely forecasts for making decisions in project regulations. For the future, it is hoped that the NWS' New Systems ("RADAP" currently in use at the Oklahoma City, OK station and the "NEXRAD" the next generation of RADAP) will provide more accurate-quantative rainfall data through digital output.

This storm event also surfaced some potential structural problems such as: (1) All projects were not designed for induced surcharge operations. (2) Catwalks provided for access to outlet works were constructed lower than induced surcharge pools. For possible resolution to this problem, an A-E contract has been let to study the feasibility of remoting gate operations. (3) At some projects, it is questionable whether adequate electrical power is available to operate the gates. The district has concern that additional back-up systems to their WCDS are needed; particularly, during a major storm event like the one of October 1986. Currently an analysis is being finalized to determine the manpower needs of Tulsa's Hydraulics and Hydrology Branch. At this point the analysis indicates that the branch needs an

additional 17 employees. Mr. Scoggins plans to have the branch analysis expanded into a report which would include manpower analyses of the entire Tulsa District. Upon completion of the report, it will be provided to SWD for concurrance and then to HQUSACE for approval.

4. Water Control Data System (WCDS). Mr. John Parks gave an overview of topics to be discussed concerning the WCDS.

a. SWD WCDS Communications Status, Plans and Problems. Mr. Gary Lakin stated that x.25 is being tested by SWL and should be operational this week; but, not sure of test status in SWF and SWT. Microcom modem has sixteen lines availabe with 2400 baud. If there is a need for stand-alone modems, will require additional lines. Mr. Parks emphasized the importance of high speed access to the Harris Computers in order to move graphics. SWT recommended that the microcom AX-9624C (error correcting modems) be adopted for this use. SWDO requested that a committee be established in order that plans may be developed and approved prior to adopting modems. Mr. Lakin also reported on the status of the splitter. The splitter from the Ground Receive Station in Ft. Worth to Dallas is not yet operational.

b. Data Collection Platforms (DCP's) and Acquisition of Field Sensor Data. Mr. John Parks reported on this activity.

1. Switch from Goes East to Goes West. The switch was made because of saturation of East Goes. HQUSACE made a request to SWD in July 87 to switch to Goes West. SWD was selected to switch because of its location with respect to Goes West. The switch will allow the Corps to group DCP data onto 1 or 2 channels. The switch has progressed well. However, the SWT will not be able to switch all stations due to obstructions. The SWL will remain on the East Goes.

2. DCP's at Lakes and Outflow Gages. Each district gave a status report on their DCP's. Mr. Parks reminded the group that the addition of DCP's would require an update of the master plan.

c. Direct Readout Ground Receive Station. Mr. Doug Perrin said that their plan is to turn the station over to the USGS for them to operate. SWF does not have the manpower to maintain the station. The USGS will be asked to provide back-up (3 days of data) if problems should occur. The USGS will have the capability to have system back operating within 24 hours. The USGS would like to have some of their own stations in the system. The Corps will have approximately 700 slots. Cost to the Corps will be about $30k/year over a 3 year period at such time the NOAAH Port should be available. The port will be used as a back-up for SWD's system.

d .WCDS Continuity of Operation Plan (Coop). Mr. Parks passed out handouts which outlined WCDS computer managment responsibilities. John stated that representatives from both SWL and SWT have been selected to assist with the plan development.

Under this plan, all H-1000's have been reconfigured. At this point, John asked for feedback concerning the reconfigurations. SWL reported no major problems. However, the question of coordination of the system is of some concern to the District. Mr. Parks' reply to the question was that a coordinator has been appointed from IMO and also represents Engineering. The intent is not to have dual efforts by both IMO and Engineering. SWL does not have a schedule for conversion to TOTAL; currently, using DSS exclusively. Mr. Sullivan emphasized the importance of having a coordinated effort in the development and implementation of the plan, i.e., by committee. SWT is currently ahead in their conversion from TOTAL to DSS. SWT uses program routines that make these conversions. SWF is currently loading the TOTAL data base; but, at this point, is still using DSS. SWT reported that TOTAL has been in use for about 2 years with only a few problems. Still have some work to be done to make TOTAL work as well as DSS. SWT Suggests a meeting to discuss the future use of TOTAL. This question needs to be answered before more effort is expended towards additional development. SWA and SWG had no additional information to be added to what had been previously stated. Mr. Parks concluded the discussion by stating that he will chair a task group of four district representatives to develop the COOP for the WCDS. A meeting is scheduled for the group to begin preparation of the plan in Dallas, Texas on 19 Nov 87.

5. HQUSACE OVERVIEW. Mr Richard DiBuono started his discussion by providing the group with some information concerning his work background. His experience has been primarily in the areas of hydraulic design and water quality. He gave assurance of support from their headquarters staff. Also presented their organizational structure which included changes that were made in March 1987. Mr. DiBuono expects better funding (1990 budget) support in the area of developing water control manuals to include drought contingency plans. In December 1987, a meeting is planned for Division offices to discuss the possibility of real-time water control data exchange.

6. POTENTIAL NWS METEOROLOGIST AND HYDROLOGIST IN THE WATER MANAGEMENT AREA. Mr. Charles Sullivan reported that SWDO is in the process of hiring a meteorologist for the SWDO Water Management Branch. The NWS has been consulted concerning the possibility of their agency providing the position with the Corps being responsible for the funding. Cost would be about $60K/year. The NWS has responded favorably to the concept and the Division Commander has given his approval. Mr. Sullivan asked District representatives to provide input in regard to what they would like to have the position provide. If possible, would like their input within the next two weeks. Mr. Walker expects the greatest benefits to be gained by SWDO with position also being an interface with the District offices. Mr. DiBuono stated that the Corps currently has two such position. He suggests that these offices be contacted to find out what kind of services are being gained from their positions. It was noted that this concept may possibly be applicable in other areas of water management, i.e., hydrology, forecasting, etc.

7. WATER CONTROL MANUALS. Mr. Ralph Garland summarized the Division's review activities for water control manuals for the past year. Also, made the observation that the number of actual manual submittals have decreased over the past few years. He reminded the group that their future manual scedules should be based upon respective District resources such as manpower, funds, etc.; thereby, resulting in a more realistic schedule for manual development. Mr. Garland informed the group that the Amarillo, Texas office of the BOR will be closing by December 1988. This office has the responsibility of BOR Section 7 Projects within the SWD region and current policies concerning the flood control regulation of these projects were formulated with this office. Therefore, it would be advantageous to complete Section 7 manuals prior to the close of the Amarillo office. Each District was asked to report on their activities that may be expected to expedite manual development. SWF is combining functions within the section to put more emphasis on manual development. SWA has included manual development as a line item in their budget. SWL expects to submit the water control manual for L&D 13 during the upcoming year. The preparation of this manual is being done by contract. Emphasis will also be placed on the White River system. To expedite time, a plan of regulation for the system will be initially submitted for review in lieu of the manual. SWT reported that their emphasis will be shifted from planning suties to H&H needs, i.e., manual development. SWG reported that work will be resumed for Addicks and Barker manuals during the year because of the progress that has been made on the rehabilitation of spillways.

8. DEMONSTRATION OF AVAILABLE WCDS SOFTWARE. Mr. Cliff Victry began the discussion by giving an overview of what software is available and software uses in regard to water control activities within SWD. Each of the five District representatives demonstrated their software through the use of slides or a combination of both slides and CRT's. Mr. Victry concluded the demonstration by presenting SWDO's products that are used in weekly water control briefings.

9. OTHER TOPICS. The focus of these discussions were on the Hydrologic Modeling Center (HMC) which is located in the Tulsa District office. The work scheduled to be accomplished during the past year was discussed . These discussions surfaced a real concern for the HMC not being able to meet its planned schedules because of unplanned studies, i.e., Arkansas River Basin studies that have taken priority over regularly scheduled studies. In an attempt to minimize future schedule conflicts, it was agreed that SWDO would keep the Districts informed of the HMC's work capability.

10. SUMMARY. Mr. Estus Walker summarized the high points of the two-day meeting and complimented the participants on their presentations. Also, stated that one of the key critical items discussed was the development of a back-up system for the WCDS and he recommended that a committee be formed as soon as possible to start the development of such a system. In closing, he asked

that each be reminded of the experiences of the September-October 1986 flood. The meeting was adjourned at 1335 on 4 November 1987.

AGENDA
1987 RCC ANNUAL MEETING
SOUTHWESTERN DIVISION
CORPS OF ENGINEERS
3-4 NOVEMBER 1987

1st Day

I. INTRODUCTION AND REMARKS. 10:00 a.m.

II. DISTRICT STATUS REPORTS.

III. TULSA DISTRICT - ARKANSAS RIVER FLOOD OF SEPTEMBER-OCTOBER 1986, ACTION ISSUES.

IV. WATER CONTROL DATA SYSTEM (WCDS).

A. SWD WCDS Communications Status, Plans and Problems.

1. X.25.
2. Microcom modems for flexibility and error checking.
3. SWD network - splitters, speed, reliability, status.
4. Direct access ports on H-1000's to allow high speed access from remote locations via voice lines.

B. Data Collection Platforms (DCP's) and Acquisition of Field Sensor Data.

1. Switch from GOES East to GOES West.
2. DCP's at lakes and outflow gages.
3. Number and types of DCP's at each district - (CE & other owners).
4. Number needed to complete network.

C. Direct Readout Ground Receive Station.

1. Possible transfer to USGS.
2. Updating DCP receive list.
3. Reliability and back-up alternative.

D. WCDS Continuity of Operation Plan (COOP).

1. Development of COOP.
2. Individual site configuration of H-1000's.
3. District reports of recent reconfiguration and installation of total data base.

Attachment No. 1

1987 RESERVOIR CONTROL CENTER MEETING
3-4 November 1987

ATTENDANCE LIST

NAME	ORGANIZATION
Frank Jaramillo	CESWA-ED-PH
Dick Kreiner	CESWA-ED-PH
Roberta Ball	CESWA-ED-PH (Part-time)
Estus Walker	CESWD-ED-W
David Brown	CESWD-ED-WA (Part-time)
Ron Hula	CESWD-ED-WH
John R. Parks	CESWD-ED-WR
Charles Sullivan	CESWD-ED-WR
Ralph Garland	CESWD-ED-WR
Cliff Victry	CESWD-ED-WR
Gary Lakin	CESWD-IM-IS (Part-time)
Kit Esserine	CESWD-IM-IS (Part-time)
Jimmy Baggett	CESWF-ED-H
Arnold Escobar	CESWF-ED-HL
Doug Perrin	CESWF-ED-HL
Bob Corby	CESWF-ED-HL (Part-time)
Paul Bowers	CESWF-ED-HL (Part-time)
Ed Reindl	CESWG-ED-HC
Loren Pope	CESWL-ED-H
James A. Proctor	CESWL-ED-HR
Jim Barton	CESWL-ED-HR
Carroll Scoggins	CESWT-ED-H
Larry Harp	CESWT-ED-HR
Jim McCoy	CESWT-ED-RD (Part-time)
Brian McCormick	CESWT-ED-RD (Part-time)
Min Y. Rokicki	OAO Corporation
Dick DiBuono	CEEC-EH-W

Attachment No. 2

AGENDA
1987 RCC ANNUAL MEETING
SOUTHWESTERN DIVISION
CORPS OF ENGINEERS
3-4 NOVEMBER 1987

2nd Day

V. HQUSACE OVERVIEW. 8:00 a.m.

VI. POTENTIAL NWS METEOROLOGIST AND HYDROLOGIST IN THE WATER MANAGEMENT AREA.

VII. WATER CONTROL MANUALS.

VIII. DEMONSTRATION OF AVAILABLE WCDS SOFTWARE.

IX. OTHER TOPICS

X. ADJOURN. 1:30 p.m.

MINUTES
Arkansas River Basin Coordinating Committee Meeting
1114 Commerce Street, Dallas, Texas
28 January 87

1. The Arkansas River Basin Coordinating Committee meeting was held in the Southwestern Division office, Corps of Engineers, Dallas, Texas, on 28 January 1987. The meeting was attended by 60 people, which included 20 of 22 Committee members and 40 invited guests.

2. Major General Hilmes, Division Engineer, Southestern Division, Corps of Engineers, and chairman of the committee, welcomed the group to Dallas and introduced the attendees. He stated that the purpose of the meeting was to assess the 1986 Arkansas River Water Control Operation Plan (Fine Tuning Plan) which was placed in effect 1 July 1986. He stated that when the plan was initiated it was agreed that the coordinating committee would periodically review the results and impacts of the plan. He said that the plan is "not locked in concrete" and that the effects of evacuation of the flood water during the October 1986 flood would be discussed at this meeting.

3. Mr. Estus Walker, Chief, Water Management Branch, Southwestern Division, Corps of Engineers, presented a brief background on the committee and introduced the speakers.

4. Mr. Ross Copley, Chief, Reservoir Control Section, Tulsa District Corps of Engineers presented a review of the operation of the Arkansas River System during the October 1986 flood. He discussed the operation of the system in accordance with the 1986 plan and compared the results with the 1979-1986 plan. In summary, the October 1986 flood demonstrated that the system does have a limited amount of flood storage and although the system prevented considerable flood damage, there was severe flooding in many areas.

5. Mr. Jim Proctor, Chief, Reservoir Section, Little Rock District Corps of Engineers, presented a review of the operation of the system as it affected the area of the river downstream from Fort Smith, Arkansas. He noted that the October 1986 flood produced the most extensive flood they have seen on the lower Arkansas River since 1973.

6. Following these presentations, committee members were given the opportunity to address the group. All committee members present made remarks appropriate to their areas of interest and expertise, stimulating considerable general discussion on the system operation for the 1986 flood event. Several members had written notes or reports. The general consensus of members was they wanted to be assured that all the water resources interests of the basin be given proper consideration in the detailed examination of the July 1986 operating plan. There was concern expressed that the value of fisheries, recreation, and tourism not be overlooked. Multi-purpose use of the water resource such

as irrigation and flood control along with navigation needs was also emphasized as important. The details of these expressions of interest in assessing the impacts on all water resource purposes are contained in the individual reports.

7. Conclusions.

a. Major General Hilmes stated that the major purpose of this meeting was to determine if there are any gross problems with the 1986 plan that should be changed prior to completion of the status report which is currently scheduled for March 1988. In regard to the above question and when the committee should meet again the consensus of the membership was as follows:

(1) Continue to use the 1986 Arkansas River Water Control Operation Plan (Fine Tuning Plan) for the remainder of the 18 month period until the status report of the ongoing Arkansas River Basin Study is completed. This study would confirm its continuation, or recommend abandonment or modification as appropriate.

(2) Another meeting of the committee would not be necessary until March 1988 when the status report is scheduled to be completed. A determination to conduct a meeting at an earlier date could be made if a significant event occurs or a milestone is reached which would warrant a committee review.

b. Committee members will be provided an opportunity to furnish information and statistics that they have available that can be used in the system analysis being performed for the report. These inputs would be through the state steering committee members, Mr. Young for Arkansas and Mr. Barnett for Oklahoma.

8. Meeting Adjourned.

9. After the meeting was adjourned Dave Burrough, Little Rock District, Corps of Engineers, presented a brief discussion and answered numerous questions about the Arkansas River Basin Study, AR-OK. This presentation was well received by the audience in that it answered a lot of concerns expressed during the committee meeting.